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MASSACHUSETTS DEPARTMENT OF EDUCATION

MCAS

MASSACHUSETTS COMPREHENSIVE ASSESSMENT SYSTEM

Release of Spring 2000 Test Items

September 2000

Massachusetts Department of Education

Massachusetts Department of Education

This document was prepared by the Massachusetts Department of Education.
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Commissioner's Foreword

Dear Colleagues:

The Massachusetts Comprehensive Assessment System (MCAS) is the Commonwealth's statewide testing program for public school students, developed in response to the Education Reform Law of 1993. MCAS is based exclusively on the rigorous academic learning standards contained in the Massachusetts *Curriculum Frameworks.* These *Frameworks* and the MCAS program have been developed with the direct and active involvement of educators from across Massachusetts and with the support of the Board of Education. Together, the *Frameworks* and MCAS are designed to raise the academic achievement of all students in the Commonwealth.

The purpose of this document is to share with educators and the public all of the test items on which the 2000 MCAS student results are based. The release of these items provides considerable information regarding the kinds of knowledge and skills that students are expected to demonstrate on the MCAS tests. Local educators are encouraged to use this document in concert with their school's *Test Item Analysis Reports* to identify strengths and weaknesses in curriculum and instruction, and to guide the changes necessary to more effectively serve students.

You will find this document on the Internet at **www.doe.mass.edu.** Please note that, due to some publishers' restrictions on copyright permissions, the paper version of this document contains some MCAS test materials that cannot be included on the Internet version.

Thank you for your support as we work together to strengthen education for our students in Massachusetts.

Sincerely,

David P. Driscoll
Commissioner of Education

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I. Introduction

Introduction

The Massachusetts Comprehensive Assessment System (MCAS) is the Commonwealth's statewide assessment program for public school students, developed in response to the Education Reform Law of 1993. MCAS is designed to promote high academic standards for all public school students across the Commonwealth by measuring student performance based on clear, uniform, statewide standards for content knowledge and skills.

Document Purpose

The purpose of this document is to share with educators and the public the common test items from the spring 2000 MCAS tests.[1] Release of these items is intended to provide additional information regarding the kinds of knowledge and skills that students are expected to demonstrate on MCAS. Local educators will be able to use this information to identify strengths and weaknesses in their curriculum and instruction, and to guide the changes necessary to more effectively meet their students' needs.

This document is also intended to be used by school and district personnel as a companion document to the school- and district-level *Test Item Analysis Reports*. Item numbers in this document correlate directly to the "Item Numbers" in the *Test Item Analysis Reports*. Each school receives a *Test Item Analysis Report* for each content area at each grade level tested (e.g., grade 10 Mathematics). These reports provide data generated from student responses to common items only. Each report lists, for the school receiving the report, the names of all enrolled students in that grade, and shows how each student answered each common item in that content area. The report identifies each item as multiple-choice, open-response, short-answer, or a writing prompt, and identifies the item's MCAS reporting category.

In addition, this document will assist school and district personnel in interpreting and using the results reported on the *Subject Area Subscore* pages of the spring 2000 *School* and *District Reports*. The *Subject Area Subscore* pages report results through MCAS reporting categories specific to each content area, and represent the only instance in which MCAS results from both common and matrix-sampled items are combined and reported.[2]

This document lists the MCAS reporting category for each common item as it is referenced in that content area's *Test Item Analysis Report* and in the *School* and *District Report Subject Area Subscore* pages.

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[1] See pages 5-6 for more information regarding the definition of common test items.
[2] See note 5 for additional information on the purposes of matrix-sampled items.

Overview of MCAS Tests

Content Areas Tested

Four content areas were tested in the spring 2000 MCAS administration:

- English Language Arts (also abbreviated as "ELA" throughout this document)
- Mathematics
- Science & Technology
- History and Social Science (grades 8 and 10 only)

Students in grades 4, 8, and 10 answered questions that were based exclusively on the learning standards defined in the Massachusetts *Curriculum Frameworks* for these content areas.[3] The questions assessed students' knowledge and skills in these areas; because questions focused on learning standards identified for all grades up to and including the tested grade level, students were required to demonstrate cumulative knowledge and skills on most MCAS questions.

Students took two tests in English Language Arts:

- ELA Composition, administered April 12, 2000 (make-up administration: May 11, 2000)
- ELA Language and Literature, administered May 15-26, 2000

The Mathematics, Science & Technology, and History and Social Science (for grades 8 and 10 only) tests were administered May 15-26, 2000.

Types of Questions

Four types of questions (items) appear on MCAS tests:

- multiple-choice questions
- open-response questions
- short-answer questions (MCAS Mathematics test only)
- writing prompts

[3] Some learning standards, including all learning standards in the *English Language Arts Curriculum Framework's Media* strand, cannot be assessed using the MCAS large-scale paper-and-pencil format and are, therefore, neither tested by MCAS nor included in this document.

Multiple-choice questions are included on all MCAS tests except the ELA Composition test, and require students to select the correct answer from a list of four options.

Open-response questions are also included on all MCAS tests except the ELA Composition test, and require students to generate, rather than recognize, a response. Depending on the content area being tested, students provide a written response of one or two paragraphs, or create a chart, table, diagram, or graph.

Short-answer questions are included only on MCAS Mathematics tests, and require students to generate a brief response, usually a short statement or numeric solution to a computation.

Writing prompts appear only on MCAS ELA Composition tests. Each grade is tested by a single writing prompt; students create a written composition in response to the prompt for their grade.

Common Items/Matrix-Sampled Items

For the spring 2000 MCAS administration, each student was issued a separate Student Test Booklet for each MCAS test in their grade:

- English Language Arts Composition
- English Language Arts Language and Literature
- Mathematics
- Science & Technology
- History and Social Science (grades 8 and 10 only)

Students at each tested grade level responded to the same (**common**) writing prompt on the ELA Composition test. Therefore, only one form of the ELA Composition Student Test Booklet was issued at each tested grade level.

There were 12 different forms per grade level of each of the other Student Test Booklets.[4] Approximately 80% of the test items in any test booklet were ***identical*** (**common items**) on all 12 test forms. The remaining 20% of the test items in each test booklet ***varied*** (**matrix-sampled items**) from form to form.

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[4] In addition to the 12 standard forms of each Student Test Booklet, three additional versions of each booklet (large-print, Braille, and Spanish-language) were available for use by eligible students. For further information on which students were eligible for testing using these non-standard Student Test Booklets, please refer to the MCAS documents, *Requirements for the Participation of Students with Disabilities: (Spring 2000 Update)* and *Requirements for the Participation of Students with Limited English Proficiency (Spring 2000 Update)*. Both publications are available on the Department's Internet site at **www.doe.mass.edu/mcas.**

Individual student test scores are based exclusively on **common items.**[5] Therefore, the Massachusetts Department of Education releases all common test items to the public following each MCAS administration to support the improvement of statewide student academic performance. Released materials are replaced with new items in the following year's MCAS tests.

The **types** and **number** of test items administered in each grade and content area during the spring 2000 MCAS administration are shown in Tables 1, 2, and 3 below.

Table 1. Spring 2000 MCAS Administration
Number of Test Items in Each Content Area by Item Type and Function
Grade 4

Item Type: **MC = Multiple-Choice Question** **OR = Open-Response Question** **SA = Short-Answer Question** **WP = Writing Prompt**

Item Function	***Content Area***							
	English Language Arts			**Mathematics**			**Science & Technology**	
	WP	**MC**	**OR**	**MC**	**SA**	**OR**	**MC**	**OR**
Common Questions (identical across all Student Test Booklet forms)	1	36	4	29	5	5	34	5
Matrix-Sampled Questions (differing among the 12 Student Test Booklet forms)	N/A	12	2	7	1	1	7	1
Total Questions	**1**	**48**	**6**	**36**	**6**	**6**	**41**	**6**

[5] MCAS reports of performance level and scaled score results include only data generated from responses to common items. In the *School* and *District Reports*, only the *Subject Area Subscore* pages include data generated from responses to both common and matrix-sampled items. Student responses to matrix-sampled items are aggregated at the school and district levels; those results are combined with common item results and reported in subject sub-areas (MCAS "reporting categories") in the MCAS *School* and *District Reports.*

Matrix-sampled items serve two primary purposes: they are the basis for equating tests from year to year, which allows for longitudinal comparisons of performance; and they efficiently sample a broader range of the curriculum than common items in a relatively modest amount of testing time. Combining student results from both common and matrix-sampled items in the *Subject Area Subscore* pages of the *School* and *District Reports* provides an indication of how successfully schools and districts are addressing the breadth of the content areas in their curricula.

Table 2. Spring 2000 MCAS Administration
Number of Test Items in Each Content Area by Item Type and Function
Grade 8

Item Type: MC = Multiple-Choice Question OR = Open-Response Question SA = Short-Answer Question WP = Writing Prompt

Item Function	*Content Area*									
	English Language Arts			Mathematics			Science & Technology		History and Social Science	
	WP	MC	OR	MC	SA	OR	MC	OR	MC	OR
Common Questions (identical across all Student Test Booklet forms)	1	36	4	29	5	5	34	5	34	5
Matrix-Sampled Questions (differing among the 12 Student Test Booklet forms)	N/A	12	2	7	1	1	7	1	7	1
Total Questions	**1**	**48**	**6**	**36**	**6**	**6**	**41**	**6**	**41**	**6**

Table 3. Spring 2000 MCAS Administration
Number of Test Items in Each Content Area by Item Type and Function
Grade 10

Item Type: MC = Multiple-Choice Question OR = Open-Response Question SA = Short-Answer Question WP = Writing Prompt

Item Function	*Content Area*									
	English Language Arts			Mathematics			Science & Technology		History and Social Science	
	WP	MC	OR	MC	SA	OR	MC	OR	MC	OR
Common Questions (identical across all Student Test Booklet forms)	1	36	4	32	4	6	36	6	32	6
Matrix-Sampled Questions (differing among the 12 Student Test Booklet forms)	N/A	12	2	7	1	1	8	1	15	3
Total Questions	**1**	**48**	**6**	**39**	**5**	**7**	**44**	**7**	**47**	**9**

Document Structure

Chapters II through XII of this document each contain information for one grade level and one content area (e.g., Chapter II = Grade 4 English Language Arts). The English Language Arts (ELA) chapter for each grade contains information for both the ELA Composition (Section A) and the ELA Language and Literature (Section B) tests for that grade. Due to copyright restrictions, certain common English Language Arts reading passages are not included in the Internet version of this document.

Each chapter begins with a list of the Massachusetts *Curriculum Framework* learning standards that are assessed by MCAS in that chapter's content area.[6] Applicable *Framework* page numbers are also identified. History and Social Science chapters list the *Framework* core knowledge topics assessed by MCAS after the learning standards list.

Each chapter next identifies the MCAS reporting categories under which test results in that content area are reported to schools and districts.

Finally, the chapter presents all common test items used to generate spring 2000 MCAS test results for that chapter's grade and content area. Each item's reporting category is listed in the shaded bar underneath the item, along with information on the learning standard or group of standards it assesses. The shaded bar for each History and Social Science item also lists the core knowledge topic assessed by the item, whenever applicable.

Correct answers for all multiple-choice questions are indicated by check marks. Correct answers for short-answer questions are shown in text boxes following the questions.

Responses to open-response items and compositions written in response to writing prompts are scored individually. An overview of procedures for scoring these responses and compositions is presented in the MCAS fact sheet, "Facts on Scoring of Student Answers to Open-Response Questions and Writing Prompts," which is available on the Department's Internet site at **www.doe.mass.edu/mcas.** Scoring procedures will also be explained further in the MCAS document, *Guide to Interpreting the 2000 MCAS Reports for Schools and Districts,* due for release in fall 2000. (Similar *Guides* are currently available on the Department's Internet site for previous years' MCAS *School* and *District Reports.*)

Test materials in this document are shown in the same order in which they were presented in the spring 2000 MCAS Student Test Booklets. The heading for each group of items indicates the test session within which those items appeared in test booklets.

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[6] In each MCAS administration, certain learning standards/core knowledge topics/reporting categories are not tested by common items, but are tested by matrix-sampled questions; these standards/topics/categories are included in this document.

However, test materials are **not** formatted exactly as they appeared in Student Test Booklets. For instance, in order to present items most efficiently in this document, the following modifications have been made:

- Some fonts and/or font sizes have been changed and/or reduced.
- Some graphics that appeared above questions in Student Test Booklets are shown instead to the side. In these instances, text in the item or in the directions that indicates the position of the graphic may be modified or deleted.
- Most graphics have been reduced in size from their appearance in Student Test Booklets; however, they maintain the same proportions in each case. Mathematics graphics that rely on the grade 4 Mathematics Tool Kit or the grades 8 or 10 Mathematics Reference Sheets are presented without any reduction in size.

Copies of the grade 4 Mathematics Tool Kit and the grades 8 and 10 Mathematics Reference Sheets used by students during MCAS Mathematics test sessions are provided in Appendix A to supplement the Mathematics chapters of this document (chapters V, VI, and VII). They are presented in Appendix A in the sizes presented to students during testing.

Additional Information on MCAS

Related Department Publications

This document is available on the Department of Education's Internet site at **www.doe.mass.edu/mcas.** However, due to copyright release restrictions, the Internet version of this document **does not include** certain English Language Arts reading passages found in chapters II, III, and IV.

The Bibliography in Appendix C lists other MCAS-related publications, including the *Curriculum Frameworks* referenced throughout this document.

MCAS Support Services

For further information about the Massachusetts Comprehensive Assessment System, please contact MCAS Support Services at

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II. English Language Arts, Grade 4

A. Composition
B. Language and Literature

English Language Arts, Grade 4
A. Composition

The spring 2000 MCAS English Language Arts Composition test was based on the learning standards of the *Composition* strand of the Massachusetts *English Language Arts Curriculum Framework* (1997).

Curriculum Framework *Learning Standards*

The learning standards for the *Composition* strand are listed below and are directly quoted from the *Framework;* applicable *Framework* page numbers are shown in parentheses.

Composition (*Framework,* pp. 56–60)

Learning Standard 19

Students will write compositions with a clear focus, logically related ideas to develop it, and adequate detail.

Learning Standard 20

Students will select and use appropriate genres, modes of reasoning, and speaking styles when writing for different audiences and rhetorical purposes.

Learning Standard 21

Students will demonstrate improvement in organization, content, paragraph development, level of detail, style, tone, and word choice (diction) in their compositions after revising them.

Learning Standard 22

Students will use knowledge of standard English conventions to edit their writing.

MCAS Reporting Category

In *Test Item Analysis Reports* and on the *Subject Area Subscore* pages of the MCAS *School* and *District Reports,* ELA Composition test results are reported under the MCAS **reporting category** of Composition.

MCAS Spring 2000 Common Test Items
ELA Composition, Grade 4

Test Sessions

MCAS ELA Composition Student Test Booklets included 2 separate test sessions, administered on the same day with a short break between sessions. During the first session, each student wrote a first draft of a composition in response to the following writing prompt. During the second session, each student revised his/her first draft and submitted his/her second draft for scoring.

Reference Materials and Tools

At least one dictionary per classroom was provided for student use during ELA Composition test sessions. No other reference materials or tools were allowed during either ELA Composition test session.

Cross-Reference Information

The shaded bar following the writing prompt indicates this item's MCAS reporting category and which *Framework* learning standards it assesses.

Grade 4 Writing Prompt

1. WRITING ASSIGNMENT

The four seasons of the year are spring, summer, fall, and winter. Choose ONE season and describe what you like to do during that season.

Reporting Category/Learning Standard for Item 1: ***Composition*/Learning Standards 19-22 (p.13)**

English Language Arts, Grade 4
B. Language and Literature

The spring 2000 MCAS English Language Arts Language and Literature test was based on the learning standards of two content strands of the Massachusetts *English Language Arts Curriculum Framework* (1997):

- Language
- Literature

Curriculum Framework *Learning Standards*

The learning standards for the *Language* and *Literature* strands are listed below and are directly quoted from the *Framework;* applicable *Framework* page numbers are shown in parentheses.

Language (*Framework,* pp. 28–31)

Learning Standard 4

Students will acquire and use correctly an advanced reading vocabulary of English words, identifying meanings through an understanding of word relationships.

Learning Standard 5

Students will identify, describe, and apply knowledge of the structure of the English language and standard English conventions for sentence structure, usage, punctuation, capitalization, and spelling.

Learning Standard 6

Students will describe and analyze how oral dialects differ from each other in English, how they differ from written standard English, and what role standard American English plays in informal and formal communication.

Learning Standard 7

Students will describe and analyze how the English language has developed and been influenced by other languages.

Literature (*Framework*, pp. 38–50)

Learning Standard 8

Students will decode accurately and understand new words encountered in their reading materials, drawing on a variety of strategies as needed, and then use these words accurately in . . . writing.

Learning Standard 9

Students will identify the basic facts and essential ideas in what they have read, heard, or viewed.

Learning Standard 10

Students will identify, analyze, and apply knowledge of the characteristics of different genres.

Learning Standard 11

Students will identify, analyze, and apply knowledge of theme in literature and provide evidence from the text to support their understanding.

Learning Standard 12

Students will identify, analyze, and apply knowledge of the structure and elements of fiction and provide evidence from the text to support their understanding.

Learning Standard 13

Students will identify, analyze, and apply knowledge of the structure, elements, and meaning of nonfiction or informational material and provide evidence from the text to support their understanding.

Learning Standard 14

Students will identify, analyze, and apply knowledge of the structure, elements, and theme of poetry and provide evidence from the text to support their understanding.

Learning Standard 15

Students will identify and analyze how an author's choice of words appeals to the senses, creates imagery, suggests mood, and sets tone.

Learning Standard 16

Students will compare and contrast similar myths and narratives from different cultures and geographic regions.

Learning Standard 17

Students will interpret the meaning of literary works, nonfiction, films, and media by using different critical lenses and analytic techniques.

MCAS Reporting Categories

In *Test Item Analysis Reports* and on the *Subject Area Subscore* pages of the MCAS *School* and *District Reports,* ELA Language and Literature test results are reported under the following two MCAS reporting categories:

- Language
- Literature

MCAS Spring 2000 Common Test Items
ELA Language and Literature, Grade 4

Test Sessions

MCAS ELA Language and Literature Student Test Booklets included 3 separate test sessions. Each session included selected readings, followed by multiple-choice and open-response questions.

Reference Materials and Tools

No reference materials or tools were allowed during any ELA Language and Literature test session.

Cross-Reference Information

The shaded bar underneath each item indicates the item's MCAS reporting category and which *Framework* learning standard it assesses. The parentheses indicate the page in this document where the learning standard may be found.

Session 1, Reading Passage #1

Do you know how "to tell time"? Read the poem below and answer the questions that follow.

Lengths of Time

Time is peculiar
And hardly exact
Though minutes are minutes,
You'll find for a fact
(As the older you get
And the bigger you grow)
That time can
Hurrylikethis
Or plod, plod, slow.

Waiting for dinner when you're hungry?
Down with the sniffles in your bed?
Notice how an hour crawls along and crawls along
Like a snail with his house upon his head.

But when you are starting
A game in the park,
It's morning,
It's noon,
And suddenly it's dark.
And hours like seconds
Rush blurringly by,
Whoosh!
Like a plane in the sky.

—*Phyllis McGinley*

Session 1, Multiple-Choice Questions

2. The words in the last two lines of the first stanza show that time

   A. gets bigger as you grow.

✔ B. can pass quickly or slowly.

   C. can run out.

   D. sneaks up on you.

Reporting Category/Learning Standard for Item 2: ***Literature*/Learning Standard 14 (p. 17)**

3. In the second stanza, ***you're*** is a contraction meaning

   A. you have.

   B. your.

✔ C. you are.

   D. you had.

Reporting Category/Learning Standard for Item 3: ***Language*/Learning Standard 5 (p. 16)**

4. The purpose of the second stanza is to describe

   A. why time changes during the day.

✔ B. when time moves slowly.

   C. how time races when you are hungry.

   D. when time can disappear.

Reporting Category/Learning Standard for Item 4: ***Literature*/Learning Standard 14 (p. 17)**

5. In stanza three, the author uses the word ***Whoosh*** to describe

✔ A. time when you are having fun.

   B. how snails move in their house.

   C. the wind outside the house.

   D. the sound of her sniffles.

Reporting Category/Learning Standard for Item 5: ***Literature*/Learning Standard 15 (p. 17)**

Session 1, Reading Passage #2

There are many ways that dogs show that they are our friends. Read the selection below and answer the questions that follow.

From

Dogs Giving a Hand

by Catherine O'Neill

As traffic comes to a halt at a busy intersection, a Labrador retriever steps off the curb. The dog walks confidently to the
1 other side of the street. His owner, a blind college student, walks just behind him, holding on to the handle of the dog's leather harness.

For the student, owning a well-trained dog guide means
2 freedom and independence. The student can go to and from class without depending on anyone else for help.

Working in partnership with a dog guide, a blind person can go almost anywhere a sighted person can. Together, dog and owner
3 walk up and down stairs. They board subways and buses. They go to restaurants. The dog acts as the blind person's eyes, guiding its owner safely wherever they go.

Dog guides for the blind are probably the most familiar of the service dogs. But did you know that dogs also act as ears for the deaf? Hearing dogs learn to notice such important sounds as those made by alarm clocks, doorbells, smoke detectors, sirens, and crying babies. They alert their owners to a noise, and let them know where the sound is coming from. Dogs can be helpful
4 partners for physically disabled people, too. At Canine Companions for Independence, in Santa Rosa, California, dogs learn to respond to 89 commands. These dogs can push elevator buttons with their paws and pull wheelchairs up steep walkways. They carry their owners' belongings in special dogpacks, open and close doors, turn on lights, and even pay for purchases. For some disabled children, having a canine companion gives them the chance to go places they've never gone before. The dogs often enable adults to take jobs and live on their own for the first time.

At some hospitals and nursing homes, dog visitors actually help improve the physical as well as the mental health of patients. Researchers have discovered that stroking an animal lowers a person's blood pressure. Because high blood pressure can lead to many illnesses, including heart disease, petting a dog can be good medicine. Some experts think that touching an animal may
5 release chemicals in the human brain that make people relax and feel good. Some nursing homes allow elderly residents to keep their own pets. In others, volunteers bring trained "therapy dogs" to visit on a regular basis. Some of these dogs have worked wonders. The elderly people look forward to the dogs' visits. One 90-year-old woman had stopped caring about life. She just stayed in bed. But once dogs became frequent visitors, she was always up and dressed, eager to greet them.

Session 1, Multiple-Choice Questions

6. The MAIN idea of this selection is that dogs assist people with disabilities by helping them

   A. with noises.

   B. cross the street.

   C. be more careful.

✔ D. be more independent.

Reporting Category/Learning Standard for Item 6: ***Literature*/Learning Standard 9 (p. 17)**

7. In the sentence "The dogs often enable adults to take jobs . . . ," the BEST meaning for the word ***enable*** is

   A. stop.

✔ B. help.

   C. follow.

   D. like.

Reporting Category/Learning Standard for Item 7: ***Language*/Learning Standard 4 (p. 16)**

8. The purpose of this selection is to

✔ A. give you information about dogs.

   B. convince you to like dogs.

   C. encourage you to buy a dog.

   D. warn you about dangerous dogs.

Reporting Category/Learning Standard for Item 8: ***Literature*/Learning Standard 13 (p. 17)**

9. According to this selection, petting dogs can help people

✔ A. feel better.

   B. notice sounds.

   C. cross the street.

   D. go many places.

Reporting Category/Learning Standard for Item 9: ***Literature*/Learning Standard 9 (p. 17)**

Session 1, Open-Response Question

10. a. Explain how dogs help people with disabilities.
    b. Explain how dogs help patients in hospitals or people in nursing homes.

    Use specific information from the selection in your explanation.

Reporting Category/Learning Standard for Item 10: ***Literature*/Learning Standard 9 (p. 17)**

Session 1, Reading Passage #3

"The Golden Touch" is a famous Greek story about a very rich king in ancient Turkey who could think of nothing but gold. Read the selection below and answer the questions that follow.

The Golden Touch

Adapted from the story by Nathaniel Hawthorne

Once upon a time there lived a very rich king whose name was Midas. He had more gold than anyone in the whole world, but for all that, he thought it was not enough. He was never so
1 happy as when he happened to get more gold to add to his treasure. He stored it away in great vaults underneath his palace, and many hours of each day were spent counting it over.

Now King Midas had a little daughter named Marygold. He loved her devotedly, and said: "She shall be the richest princess in all the world!" But little Marygold cared nothing about it all. She loved her garden, her flowers, and the
2 golden sunshine more than all her father's riches. She was a lonely little girl most of the time, for her father was so busy planning new ways to get more gold, and counting what he had, that he seldom told her stories or went for walks with her, as all fathers should do.

One day King Midas was down in his treasure room. He had locked the heavy doors and had opened up his great chests of gold. He piled it on the table and handled it as if he loved the touch of it. He let it slip through his fingers and
3 smiled at the clink of it as if it had been sweet music. Suddenly a shadow fell over the heap of gold. Looking up, he saw a stranger dressed in shining white smiling down at him. King Midas started up in surprise. Surely he had not failed to lock the door! His treasure was not safe! But the stranger continued to smile.

4 "You have much gold, King Midas," he said.

5 "Yes," said the king, "but think how little this is to all the gold there is in the world!"

6 "What! Are you not satisfied?" asked the stranger.

"Satisfied?" said the king. "Of course I'm not. I often lie awake through the long night planning new ways to get more gold. I wish
7 that everything I touch would turn to gold."

"Do you really wish that, King Midas?"

8 "Of course I wish it. Nothing could make me so happy."

9 "Then you shall have your wish. Tomorrow morning when the first rays of the sun fall through
10 your window you shall have the golden touch."

When he had finished speaking, the stranger vanished. King Midas rubbed his eyes. "I must have dreamed it," he said, "but how happy I
11 should be if it were only true!"

The next morning King Midas woke when the first faint light came into his room. He put out his hand and touched the covers of his bed. Nothing happened. "I knew it could not be true,"
12 he sighed. Just at that moment the first rays of the sun came through the window. The covers on which King Midas's hand lay became pure gold. "It's true, it's true!" he cried joyfully.

He sprang out of bed and ran about the room touching everything. His dressing gown, his slippers, the furniture, all became gold. He looked
13 out of the window through Marygold's garden.

"I'll give her a nice surprise," he said. He went down into the garden touching all of Marygold's flowers, and changing them to gold.
14 "She will be so pleased," he thought.

He went back into his room to wait for his breakfast, and took up his book which he had
15 been reading the night before, but the minute he touched it, it was solid gold. "I can't read it now," he said, "but of course it is far better to have it gold."

Just then a servant came through the door
16 with the king's breakfast. "How good it looks," he said. "I'll have that ripe, red peach first of all."

He took the peach in his hand, but before he could taste it, it became a lump of gold. King Midas put it back on the plate. "It's very beauti-
17 ful, but I can't eat it!" he said. He took a roll from the plate, but that, too, became gold. He took a glass of water in his hand, but that, too, became gold. "What shall I do," he cried. "I am hungry and thirsty, I can't eat or drink gold!"

At that moment the door was opened and in
18 came little Marygold. She was crying bitterly, and in her hand was one of her roses.

19 "What's the matter, little daughter?" said the king.

20 "Oh, Father! See what has happened to all my roses! They are stiff, ugly things!"

"Why, they are golden roses, child. Do you
21 not think they are more beautiful than they were?"

"No," she sobbed, "they do not smell sweet.
22 They won't grow anymore. I like roses that are alive."

"Never mind," said the king, "eat your breakfast now." But Marygold noticed that her father did not eat, and that he looked very sad. "What is the matter, Father dear?" she said, and she ran over to him. She threw her arms about
23 him, and he kissed her. But he suddenly cried out in terror and anguish. When he touched her, her lovely little face became glittering gold, her eyes could not see, her lips could not kiss him back again, her little arms could not hold him close. She was no longer a loving, laughing little girl; she was changed to a little golden statue.

24 King Midas bowed his head and great sobs shook him.

"Are you happy, King Midas?" he heard a
25 voice say. Looking up he saw the stranger standing near him.

26 "Happy! How can you ask? I am the most miserable man living!" said the king.

27 "You have the golden touch," said the stranger. "Is that not enough?"

28 King Midas did not look up or answer.

"Which would you rather have, food and a
29 cup of cold water or these lumps of gold?" said the stranger.

30 King Midas could not answer.

"Which would you rather have, O King—
31 that little golden statue, or a little girl who could run, and laugh, and love you?"

"Oh, give me back my little Marygold and
32 I'll give up all the gold I have!" said the king. "I've lost all that was worth having."

"You are wiser than you were, King Midas," said the stranger. "Go plunge in the river which
33 runs at the foot of your garden, then take some of its water and sprinkle whatever you wish to change back as it was." The stranger vanished.

King Midas sprang up and ran to the river. He plunged into it, and then he dipped up a pitcher of its water and hurried back to the palace. He sprinkled it over Marygold, and the color came back into her cheeks. She opened her
34 blue eyes again. "Why, Father!" she said. "What happened?" With a cry of joy King Midas took her into his arms. Never after that did King Midas care for any gold except the gold of the sunshine, and the gold of little Marygold's hair.

Session 1, Multiple-Choice Questions

11. The words in the opening paragraph that suggest this is not a true story are

A. "He stored it away . . ."

B. ". . . more gold than anyone . . ."

C. ". . . many hours of each day . . ."

✔ D. "Once upon a time . . ."

Reporting Category/Learning Standard for Item 11: ***Literature*/Learning Standard 10 (p. 17)**

12. In paragraph 1, when it is said that King Midas keeps his treasure in ***great vaults***, it means that his money is

A. lost.

B. worthless.

✔ C. locked away.

D. to be spent freely.

Reporting Category/Learning Standard for Item 12: ***Literature*/Learning Standard 8 (p. 17)**

13. What was the MAIN reason that Marygold was lonely?

A. She had no mother.

B. She had no friends.

✔ C. Her father did not pay attention to her.

D. All she had were flowers and sunshine.

Reporting Category/Learning Standard for Item 13: ***Literature*/Learning Standard 12 (p. 17)**

14. "The Golden Touch" is an example of a

A. play.

✔ B. myth.

C. mystery.

D. biography.

Reporting Category/Learning Standard for Item 14: ***Literature*/Learning Standard 10 (p. 17)**

15. You can conclude from reading this story that the stranger was a

    A. thief.

    B. husband for Marygold.

    C. relative.

✔ D. supernatural being.

Reporting Category/Learning Standard for Item 15: ***Literature*/Learning Standard 16 (p. 18)**

16. The stranger gave King Midas the ability to change things back to their natural state (the way they were). This shows the stranger thought King Midas had

    A. too much to eat.

    B. tricked Marygold.

✔ C. learned his lesson.

    D. too much gold.

Reporting Category/Learning Standard for Item 16: ***Literature*/Learning Standard 12 (p. 17)**

17. A sentence in paragraph 23 is, "But he suddenly cried out in terror and anguish." Based on clues in paragraphs 23 and 24, another word for ***anguish*** is

✔ A. pain.

    B. joy.

    C. hunger.

    D. surprise.

Reporting Category/Learning Standard for Item 17: ***Literature*/Learning Standard 8 (p. 17)**

18. The moral of this story is

    A. gold will finally turn to dust.

✔ B. be careful what you wish for.

    C. hard work is always rewarded.

    D. good things come to those who wait.

Reporting Category/Learning Standard for Item 18: ***Literature*/Learning Standard 11 (p. 17)**

Session 1, Open-Response Question

19. What lesson did the stranger teach King Midas? Give TWO details from the selection to explain your answer.

*Reporting Category/*Learning Standard for Item 19: ***Literature/*Learning Standard 12 (p. 17)**

Session 2, Reading Passage #1

A young boy, Sam Gribley, speaks in the opening chapter of the novel My Side of the Mountain. *Read the selection below and answer the questions that follow.*

"I Hole Up in a Snowstorm"
from
My Side of the Mountain
by Jean Craighead George

"I am on my mountain in a tree home that people have passed without ever knowing that I am here. The house is a hemlock tree six feet in
1 diameter, and must be as old as the mountain itself. I came upon it last summer and dug and burned it out until I made a snug cave in the tree that I now call home.

"My bed is on the right as you enter, and is made of ash slats and covered with deerskin. On the left is a small fireplace about knee high. It is of clay and stones. It has a chimney that leads the
2 smoke out through a knothole. I chipped out three other knotholes to let fresh air in. The air coming in is bitter cold. It must be below zero outside, and yet I can sit here inside my tree and write with bare hands. The fire is small, too. It doesn't take much fire to warm this tree room.

"It is the fourth of December, I think. It may be the fifth. I am not sure because I have not recently counted the notches in the aspen pole that is my
3 calendar. I have been just too busy gathering nuts and berries, smoking venison, fish, and small game to keep up with the exact date.

"The lamp I am writing by is deer fat poured into a turtle shell with a
4 strip of my old city trousers for a wick.

"It snowed all day yesterday and today. I have not been outside since the
5 storm began, and I am bored for the first time since I ran away from home eight months ago to live on the land.

"I am well and healthy. The food is good. Sometimes I eat turtle soup,
6 and I know how to make acorn pancakes. I keep my supplies in the wall of the tree in wooden pockets that I chopped myself.

"Every time I have looked at those pockets during the last two days, I
7 have felt just like a squirrel, which reminds me: I didn't see a squirrel one whole day before that storm began. I guess they are holed up and eating their stored nuts, too.

"I wonder if The Baron, that's the wild weasel who lives behind the big boulder to the north of my tree, is also denned up. Well, anyway, I think the
8 storm is dying down because the tree is not crying so much. When the wind really blows, the whole tree moans right down to the roots, which is where I am.

"Tomorrow I hope The Baron and I can tunnel out into the sunlight. I wonder if I should dig the snow. But that would mean I would have to put it
9 somewhere, and the only place to put it is in my nice snug tree. Maybe I can pack it with my hands as I go. I've always dug into the snow from the top, never up from under.

"The Baron must dig up from under the snow. I wonder where he puts
10 what he digs? Well, I guess I'll know in the morning."

When I wrote that last winter, I was scared and thought maybe I'd never get out of my tree. I had been scared for two days—ever since the first bliz-
11 zard hit the Catskill Mountains. When I came up to the sunlight, which I did by simply poking my head into the soft snow and standing up, I laughed at my dark fears.

Everything was white, clean, shining, and beautiful. The sky was blue, blue, blue. The hemlock grove was laced with snow, the meadow was
12 smooth and white, and the gorge was sparkling with ice. It was so beautiful and peaceful that I laughed out loud. I guess I laughed because my first snowstorm was over and it had not been so terrible after all.

Session 2, Multiple-Choice Questions

20. The MAIN purpose of the first six paragraphs is to

✔ A. describe Sam's home.

B. explain why he ran away.

C. introduce the characters.

D. summarize what will happen next.

Reporting Category/Learning Standard for Item 20: ***Literature*/Learning Standard 12 (p. 17)**

21. In what season did Sam start building his tree home?

A. winter

B. fall

C. spring

✔ D. summer

Reporting Category/Learning Standard for Item 21: ***Literature*/Learning Standard 9 (p. 17)**

22. Which word BEST describes Sam's home?

A. fancy

✔ B. compact

C. messy

D. large

Reporting Category/Learning Standard for Item 22: ***Literature*/Learning Standard 15 (p. 17)**

23. In paragraph 2, Sam says the air is ***bitter cold***. This means that it is

A. always cold.

B. sort of cold.

✔ C. very cold.

D. not cold.

Reporting Category/Learning Standard for Item 23: ***Literature*/Learning Standard 8 (p. 17)**

24. In this selection, ***holed up*** and ***denned up*** are phrases that

    A. contain prefixes.

    B. include compound words.

✔ C. mean the same thing.

    D. have opposite meanings.

Reporting Category/Learning Standard for Item 24: ***Language*/Learning Standard 4 (p. 16)**

25. According to paragraph 8, where is Sam during the storm?

    A. the branches

✔ B. the roots

    C. the treetops

    D. the knothole

Reporting Category/Learning Standard for Item 25: ***Literature*/Learning Standard 9 (p. 17)**

26. The extra space between paragraph 10 and paragraph 11 signifies a change in

✔ A. time.

    B. speaker.

    C. setting.

    D. chapter.

Reporting Category/Learning Standard for Item 26: ***Literature*/Learning Standard 12 (p. 17)**

27. The effect of the author's language in paragraph 12 is to help the reader

    A. feel Sam's fear of the snow.

    B. find where he put the snow.

    C. know how deep the snow was.

✔ D. see the beauty of the new snow.

Reporting Category/Learning Standard for Item 27: ***Literature*/Learning Standard 15 (p. 17)**

Session 2, Open-Response Question

28. Sam compares his activities to the activities of a squirrel and a weasel that live near his mountain home. Explain how these animals' activities are similar to Sam's activities. Use specific information from the selection in your answer.

Reporting Category/Learning Standard for Item 28: ***Literature*/Learning Standard 12 (p. 17)**

Session 3, Reading Passage #1

Mummies are dead bodies that were wrapped in cloth and preserved in ancient Egypt. Read this passage to learn about how mummies were made and used. Then answer the questions that follow.

Millions of Mummies

by Janet J. Kosky

Dr. and Mrs. James Sullivan cordially invite you to witness the unwrapping of a mummy, recently acquired on a tour of Egypt, on Saturday, October 31 at 8:00 p.m. sharp. Refreshments will be served.

SOUND LIKE A joke for a Halloween party? Actually, even though this isn't an actual invitation, it isn't too far from reality. During the 1800s, mummy unwrapping became quite popular. All of Europe had heard of the magnificent temples and tombs rediscovered by Napoleon when he invaded Egypt in 1798. Later, many people
1 traveled there to see these curiosities for themselves. Some even brought mummies home with them. But many more were shipped to Europe by dealers who specialized in selling mummies, sarcophagi, and other ancient artifacts. Often these treasures were taken without permission from the Egyptian authorities and without respect for the religious beliefs of the dead.

Although mummies are considered rare today, at one time there were so many of them, it seemed unlikely that the supply would ever run out. The custom of making
2 mummies in Egypt lasted for over 3,000 years and was practiced not only by the Pharaohs and other members of the royal court, but also by any citizen with enough money to afford it.

At times there were so many wrapped bodies that cemeteries couldn't hold them all. Tombs have been discovered where mummies were stacked on top of each other six feet
3 deep. Sometimes people even had to keep a mummy in their house until there was a vacancy in a cemetery.

And humans weren't the only ones mummified. Sacred animals and favorite pets were also preserved. Cats and dogs were the most common animals to be buried, but
4 archeologists have also found mummies of monkeys, gazelles, falcons, crocodiles, mongooses, snakes, beetles, and scorpions.

The ancient Egyptians made mummies because they believed that all living things consisted of two parts: the body and the spirit. Life ceased when the spirit left the body, and in order for someone to be reborn in the afterlife, spirit and body had to be reunited. If the body was destroyed before the spirit came back from its judgment, there couldn't
5 be a rebirth. Animals were preserved not only because they were sacred, but also to provide companionship in the afterlife. Including both people and animals, some experts have estimated that several million bodies were turned into mummies. So, what would it matter if a few hundred were taken away by collectors?

Mummies were valued for a more important reason than collecting: people believed that the powder from ground-up mummies was a valuable medicine. It was used to treat headaches, coughs, skin rashes, nausea, ulcers, and other ailments. Supposedly, it was
6 the resin and oils used in embalming that were beneficial. Mummies were also believed to contain bitumen, an oily tar people thought was medicinal. As it turns out, bitumen was never used for wrapping. However, the Arabic word for bitumen—*mumiyah*—is where we get the word mummy.

Medicine was not the only unusual use for mummies. In 1859, an Egyptian farmer was plowing his field when he discovered a gigantic cat cemetery. A total of 300,000 cat
7 mummies were removed from the site, many of them in such poor condition that they crumbled when touched. Most of them were shipped to England to be used—believe it or not—for fertilizer. . . .

Only relatively recently have authorities taken measures to preserve Egypt's national
8 treasures from further destruction and deterioration. However, even though so many mummies have been lost forever, those remaining can still teach us much about life—and death—in ancient Egypt.

Session 3, Multiple-Choice Questions

29. "Millions of Mummies" is a good title for this selection because

    A. someone counted all the mummies made.

    B. mummies are so valuable.

    C. mummies have so many uses.

✔ D. so many mummies were made of people and animals.

Reporting Category/Learning Standard for Item 29: ***Literature*/Learning Standard 13 (p. 17)**

30. According to the first paragraph, what was the MAIN reason people wanted to unwrap mummies?

    A. They wanted to give the mummies a proper burial.

    B. They wanted to study diseases of ancient Egyptians.

✔ C. They wanted to satisfy their curiosity.

    D. They wanted to preserve the bodies before they crumbled.

Reporting Category/Learning Standard for Item 30: ***Literature*/Learning Standard 13 (p. 17)**

31. According to this selection, why were mummies stacked on top of each other in ancient Egyptian tombs?

    A. They would not dry out as fast.

    B. It was thought to confuse bad spirits.

    C. Family members were always buried together.

✔ D. There was not enough room in cemeteries.

Reporting Category/Learning Standard for Item 31: ***Literature*/Learning Standard 9 (p. 17)**

32. According to this selection, one reason Egyptians mummified animals was to

    A. send messages to the living.

✔ B. have company in the afterlife.

    C. protect their tombs.

    D. save them as national treasures.

Reporting Category/Learning Standard for Item 32: ***Literature*/Learning Standard 9 (p. 17)**

33. Which of the following were most likely NOT mummified in ancient Egypt?

A. pharaohs

✔ B. archaeologists

C. members of the royal court

D. sacred animals and favorite pets

Reporting Category/Learning Standard for Item 33: ***Literature*/Learning Standard 9 (p. 17)**

34. In paragraph 4, the commas between ". . . monkeys, gazelles, falcons, crocodiles, mongooses, snakes, beetles, and scorpions," are used to

A. indicate a pause.

B. set off the meanings.

✔ C. separate words in a series.

D. help the reader pronounce the words.

Reporting Category/Learning Standard for Item 34: ***Language*/Learning Standard 5 (p. 16)**

35. In the sentence that begins, "Life ceased when the spirit left the body . . . ," the word ***ceased*** means

✔ A. ended.

B. improved.

C. burst.

D. flowed in.

Reporting Category/Learning Standard for Item 35: ***Literature*/Learning Standard 8 (p. 17)**

36. The writer uses the last paragraph of "Millions of Mummies" to explain

A. what happened to the millions of mummies.

B. why Egypt now has the last few mummies.

C. how mummies start to crumble and are destroyed.

✔ D. why the mummies that remain must be protected.

Reporting Category/Learning Standard for Item 36: ***Literature*/Learning Standard 13 (p. 17)**

Session 3, Open-Response Question

37. Explain why, according to the selection, mummies are considered Egypt's national treasures. Use specific information from the selection to explain their importance.

Reporting Category/Learning Standard for Item 37: ***Literature*/Learning Standard 9 (p. 17)**

Session 3, Reading Passage #2

Use the dictionary page below to answer the questions that follow.

Dictionary Page

-ous / outlying

-ous A *suffix* that means "full of." *Dangerous* means "full of danger." *Ambitious* means "full of ambition."

out The water flowed *out*. The doctor is *out* for the day. The children went *out* to play. He put *out* his hand for the candy. The firemen put *out* the fire. We are *out* of butter. The sun came *out* after the rain. The dress is made *out* of silk. She looked *out* the window.
out (out) *adverb; adjective; preposition.*

out•board motor (out′bôrd′).

outbreak A breaking out of something. There was an *outbreak* of flu last winter.
out•break (out′brāk′) *noun, plural* **outbreaks.**

outburst A bursting forth of something. We were surprised by her *outburst* of anger.
out•burst (out′burst′) *noun, plural* **outbursts.**

outcome A result; end. We are waiting to hear the *outcome* of the election.
out•come (out′kum′) *noun, plural* **outcomes.**

out•do (out′do͞o′) *verb,* **outdid, outdone, outdoing.**

outdoor Used or done out in the open instead of inside a house or other building. Baseball is an *outdoor* game.
out•door (out′dôr′) *adjective.*

outdoors Not in a house or other building; out under the sky. We ate *outdoors* under a tree. *Adverb.* —The world that is outside houses or other buildings; the open air. We took a walk in the *outdoors*. *Noun.*
out•doors (out′dôrz′) *adverb; noun.*

outfit **1.** All the articles or pieces of equipment needed for doing something. I bought a skiing *outfit*. **2.** A set of clothes. The hat, shoes, and rest of her *outfit* were red. **3.** A group of people who work or belong together. What army *outfit* was his father in during the war? *Noun.* —To give articles or equipment needed for doing something. They *outfitted* the mountain climbers. *Verb.*
out•fit (out′fit) *noun, plural* **outfits;** *verb,* **outfitted, outfitting.**

outgoing Friendly and liking to talk. An *outgoing* person makes friends easily.
out•go•ing (out′go′ing) *adjective.*

outgrow **1.** To grow too big for. The baby will soon *outgrow* his clothes. **2.** To leave behind or lose as one grows older. She *outgrew* her fear of the dark.
out•grow (out′gro′) *verb,* **outgrew, outgrown, outgrowing.**

outing A short trip for pleasure. All the students enjoyed the school *outing* to the state park.
out•ing (out′ing) *noun, plural* **outings.**

outlet **1.** A place at which something comes out. Dead leaves clogged the *outlets* of the drainpipes. **2.** A means of expressing or getting rid of something. Playing tennis is a good *outlet* for a person's energy. **3.** A place in an electric wiring system for plugging in appliances. The toaster was plugged into the *outlet.*
out•let (out′let) *noun, plural* **outlets.**

outline **1.** The shape of an object formed by following along its outer edges. Through the fog, we saw the *outline* of a passing ship. **2.** A summary of a story, speech, or other writing. He made a brief *outline* of his book report before he began to write it. *Noun.* —To give a summary of. The general *outlined* his plan of attack. *Verb.*

a flower and its outline

out•line (out′līn′) *noun, plural* **outlines;** *verb,* **outlined, outlining.**

outlying Located far from the center of something. The zoo is located in an *outlying* district of the city.
out•ly•ing (out′lī′ing) *adjective.*

Session 3, Multiple-Choice Questions

38. This appears at the upper left of the dictionary page.

-ous / outlying

This is done to

A. tell the meaning of ***-ous***.

✔ B. show the page's alphabetic range of words.

C. indicate the main topics listed.

D. give the plural ending of ***outlying***.

Reporting Category/Learning Standard for Item 38: ***Literature*/Learning Standard 13 (p. 17)**

39. When the suffix ***-ous*** is added to the word ***miracle***, this makes the word ***miraculous***, which means

✔ A. full of miracles.

B. not due to miracles.

C. similar to miracles.

D. afraid of miracles.

Reporting Category/Learning Standard for Item 39: ***Literature*/Learning Standard 8 (p. 17)**

40. The purpose of spelling the word ***outdoors*** as (out´dôrz´) is to

✔ A. show the pronunciation of the word.

B. tell the meaning of the word.

C. explain the origin of the word.

D. tell the part of speech of the word.

Reporting Category/Learning Standard for Item 40: ***Literature*/Learning Standard 13 (p. 17)**

41. According to the dictionary page, which word means "a summary of a story, speech, or other writing"?

A. outbreak

B. outfit

✔ C. outline

D. outlying

Reporting Category/Learning Standard for Item 41: ***Literature*/Learning Standard 9 (p. 17)**

III. English Language Arts, Grade 8

A. Composition
B. Language and Literature

English Language Arts, Grade 8
A. Composition

The spring 2000 MCAS English Language Arts Composition test was based on the learning standards of the *Composition* strand of the Massachusetts *English Language Arts Curriculum Framework* (1997).

Curriculum Framework *Learning Standards*

The learning standards for the *Composition* strand are listed below and are directly quoted from the *Framework;* applicable *Framework* page numbers are shown in parentheses.

Composition (*Framework,* pp. 56–60)

Learning Standard 19

Students will write compositions with a clear focus, logically related ideas to develop it, and adequate detail.

Learning Standard 20

Students will select and use appropriate genres, modes of reasoning, and speaking styles when writing for different audiences and rhetorical purposes.

Learning Standard 21

Students will demonstrate improvement in organization, content, paragraph development, level of detail, style, tone, and word choice (diction) in their compositions after revising them.

Learning Standard 22

Students will use knowledge of standard English conventions to edit their writing.

MCAS Reporting Category

In *Test Item Analysis Reports* and on the *Subject Area Subscore* pages of the MCAS *School* and *District Reports,* ELA Composition test results are reported under the MCAS **reporting category** of Composition.

MCAS Spring 2000 Common Test Items
ELA Composition, Grade 8

Test Sessions

MCAS ELA Composition Student Test Booklets included 2 separate test sessions, administered on the same day with a short break between sessions. During the first session, each student wrote a first draft of a composition in response to the following writing prompt. During the second session, each student revised his/her first draft and submitted his/her second draft for scoring.

Reference Materials and Tools

At least one dictionary per classroom was provided for student use during ELA Composition test sessions. No other reference materials or tools were allowed during either ELA Composition test session.

Cross-Reference Information

The shaded bar following the writing prompt indicates this item's MCAS reporting category and which *Framework* learning standards it assesses.

Grade 8 Writing Prompt

1. Background for Writing

The local school committee is seeking ideas to improve your school. These ideas will be discussed during meetings with students, teachers, parents, administrators, and other interested parties. The changes proposed by students will be seriously considered since students are the reason for the school's existence.

Choose one change that might improve your school for all students. Write a persuasive essay explaining why your suggested change is an improvement.

Writing Assignment

Write a persuasive essay describing one change that will improve your school. Give at least two reasons to show how your suggestion will improve your school.

Remember, you must argue in a convincing manner so that the school committee will understand and agree with your position.

Reporting Category/Learning Standard for Item 1: ***Composition*/Learning Standards 19-22 (p. 45)**

English Language Arts, Grade 8
B. Language and Literature

The spring 2000 MCAS English Language Arts Language and Literature test was based on the learning standards of two content strands of the Massachusetts *English Language Arts Curriculum Framework* (1997):

- Language
- Literature

Curriculum Framework *Learning Standards*

The learning standards for the *Language* and *Literature* strands are listed below and are directly quoted from the *Framework;* applicable *Framework* page numbers are shown in parentheses.

Language (*Framework,* pp. 28–31)

Learning Standard 4

Students will acquire and use correctly an advanced reading vocabulary of English words, identifying meanings through an understanding of word relationships.

Learning Standard 5

Students will identify, describe, and apply knowledge of the structure of the English language and standard English conventions for sentence structure, usage, punctuation, capitalization, and spelling.

Learning Standard 6

Students will describe and analyze how oral dialects differ from each other in English, how they differ from written standard English, and what role standard American English plays in informal and formal communication.

Learning Standard 7

Students will describe and analyze how the English language has developed and been influenced by other languages.

Literature (*Framework*, pp. 38–50)

Learning Standard 8

Students will decode accurately and understand new words encountered in their reading materials, drawing on a variety of strategies as needed, and then use these words accurately in . . . writing.

Learning Standard 9

Students will identify the basic facts and essential ideas in what they have read, heard, or viewed.

Learning Standard 10

Students will identify, analyze, and apply knowledge of the characteristics of different genres.

Learning Standard 11

Students will identify, analyze, and apply knowledge of theme in literature and provide evidence from the text to support their understanding.

Learning Standard 12

Students will identify, analyze, and apply knowledge of the structure and elements of fiction and provide evidence from the text to support their understanding.

Learning Standard 13

Students will identify, analyze, and apply knowledge of the structure, elements, and meaning of nonfiction or informational material and provide evidence from the text to support their understanding.

Learning Standard 14

Students will identify, analyze, and apply knowledge of the structure, elements, and theme of poetry and provide evidence from the text to support their understanding.

Learning Standard 15

Students will identify and analyze how an author's choice of words appeals to the senses, creates imagery, suggests mood, and sets tone.

Learning Standard 16

Students will compare and contrast similar myths and narratives from different cultures and geographic regions.

Learning Standard 17

Students will interpret the meaning of literary works, nonfiction, films, and media by using different critical lenses and analytic techniques.

MCAS Reporting Categories

In *Test Item Analysis Reports* and on the *Subject Area Subscore* pages of the MCAS *School* and *District Reports,* ELA Language and Literature test results are reported under the following two MCAS reporting categories:

- Language
- Literature

MCAS Spring 2000 Common Test Items
ELA Language and Literature, Grade 8

Test Sessions

MCAS ELA Language and Literature Student Test Booklets included 3 separate test sessions. Each session included selected readings, followed by multiple-choice and open-response questions.

Reference Materials and Tools

No reference materials or tools were allowed during any ELA Language and Literature test session.

Cross-Reference Information

The shaded bar underneath each item indicates the item's MCAS reporting category and which *Framework* learning standard it assesses. The parentheses indicate the page in this document where the learning standard may be found.

Session 1, Reading Passage #1

Surely "Hector, the Stowaway Dog" is one of the most amazing true stories about dogs. Read it and answer the questions that follow.

HECTOR, the Stowaway Dog

by Captain Kenneth Dodson

Second Officer Harold Kildall of the *Hanley* noticed the dog first. The *Hanley*, a freighter, was one of five ships loading at the Government Dock in Vancouver, British Columbia, on April 20, 1922. Checking chain lashings, Kildall glanced up to see a large smooth-haired terrier, white with black markings, coming aboard by the gangplank. Once aboard, the dog stood absolutely still, looking and listening
1 all about the deck. He sniffed at the deck cargo of fresh-sawed timbers and at the sacks of grain being loaded into the last hatch. Then he returned ashore, only to board the next ship, which was loading apples, flour and fir logs for England. Here the terrier again sniffed at the cargo and about the decks and living quarters, then slowly went ashore.

The dog's strange actions made Kildall curious. Now he watched the dog board a freighter loading paper pulp for East Coast ports. The dog boarded the
2 other ships in turn, examining each in the same careful fashion. After that, busy getting ready for sea, Kildall forgot the whole thing. And at noon the *Hanley* got under way for the long trip to Japan.

Early the next morning the dog was found lying on a mat outside the cabin of the *Hanley's* captain. Unseen, he had come aboard again and stowed away for the voyage. The captain, who loved dogs, tried to be friendly, but the terrier would not
3 warm up to him. Kildall and others tried, too, to win him over. To all of them he remained distant and cool. He just walked about the captain's deck, sniffing the salt air.

Late that first morning, when Kildall went below to eat, the dog followed him and stood at the galley door, waiting expectantly. The cook gave him his best left-overs. When Kildall climbed to the bridge to take over the watch, the dog followed
4 close behind, walked through the pilothouse, took a turn through the chartroom, then ran up the ladder to the flying bridge and stood beside the compass housing. Seeming to be satisfied, he lay down in a comfortable corner and went to sleep. Obviously this stowaway was an old sea dog.

For 18 days the *Hanley* sailed across the northern rim of the Pacific. Day after day her officers and men tried to make up to the dog but he remained aloof. He
5 allowed his head to be patted but showed no return of affection. When not "on watch" with Kildall he remained at the captain's door, going below decks only for his meals.

When the coast of Honshu was sighted, the stowaway sniffed the land breeze and stared straight ahead as the land came in sight. His interest grew as the *Hanley* moved through the Yokohama breakwaters to its anchoring place near some other ships unloading cargos.

6

While directing cargo work, Kildall noticed that the dog was very alert, his tail switching from time to time and his nostrils quivering nervously as he stared at the other ships. The nearest of these, the *Simaloer*, was, like the *Hanley*, unloading squared timbers into the harbor.

7

Soon the *Hanley* swung with the tide so that her stern pointed in the direction of the *Simaloer*, now some 300 yards away. At once the dog's attention centered on her. He ran to the rear of the ship, as close to her as possible, and sniffed the air with rising excitement. While Kildall watched, a sampan came alongside the *Simaloer*, took two sailors aboard and set off for shore on a course that carried the boat close under the *Hanley's* stern.

8

Whining softly, the dog watched. Suddenly he began running back and forth in wild excitement, barking madly. This caught the attention of the passengers in the sampan. Shading their eyes against the sun, they stared at the *Hanley's* stern.

9

Suddenly one of them jumped to his feet and began shouting and waving his arms, motioning to the sampan man and slapping the other sailor on the back. His excitement matched the dog's. Now, as the sampan came alongside the *Hanley's* boarding ladder, the dog became so worked up that he jumped into the water. The shouting man pulled him aboard the sampan and hugged him close, wet coat and all. The dog whined with joy and licked his face. Obviously a dog and his master had been reunited.

10

The reunion of the stowaway and his happy owner became the talk of the crews of both ships. The dog's name, it turned out, was Hector. His owner, W. H. Mante, second officer of the *Simaloer*, had the same duties and the same watches to stand as Kildall had on the *Hanley*. At Government dock in Vancouver, the *Simaloer* had changed its position to take on fuel while Hector was off for a last run before the long voyage. Mante searched the waterfront wildly but failed to find Hector in time—and the *Simaloer* sailed without him.

11

What mysterious sense could have guided Hector's careful search for the one ship out of many that would carry him across an ocean to rejoin his master? Did the kind of cargo the *Hanley* carried and perhaps other signs tell him that the *Hanley* was headed for the same port as his own ship? Did he then attach himself to the officer whose duties were like his master's? Any answers would be the guesswork of men, who know only that it happened.

12

Session 1, Multiple-Choice Questions

2. In the first paragraph, the author begins his story with a long description of

   A. ships loading at a dock.

   B. the duties of a ship's officer.

✔ C. the strange behavior of a dog.

   D. the kinds of cargo carried by freighters.

Reporting Category/Learning Standard for Item 2: ***Literature*/Learning Standard 13 (p. 49)**

3. In the beginning of the story, the dog that Kildall watched appeared to be

   A. looking for somebody to take care of him.

✔ B. inspecting the boats and their cargo.

   C. searching for food.

   D. unusually cautious.

Reporting Category/Learning Standard for Item 3: ***Literature*/Learning Standard 9 (p. 49)**

4. "The cook gave him his best leftovers." This sentence is a

✔ A. simple sentence.

   B. compound sentence.

   C. complex sentence.

   D. compound-complex sentence.

Reporting Category/Learning Standard for Item 4: ***Language*/Learning Standard 5 (p. 48)**

5. At the end of paragraph 4, the author called the stowaway a "sea dog" because the dog

✔ A. was used to being on ships at sea.

   B. was a powerful swimmer.

   C. liked the food sailors usually ate.

   D. would travel all over the world by stowing away on ships.

Reporting Category/Learning Standard for Item 5: ***Literature*/Learning Standard 15 (p. 49)**

6. The word *aloof* in paragraph 5 means

   A. lonely.

   B. scornful.

✔ C. distant and unfriendly.

   D. excited and nervous.

Reporting Category/Learning Standard for Item 6: ***Literature*/Learning Standard 8 (p. 49)**

7. How did the dog behave when the ship first docked at Yokohama?

   A. He was sad and very quiet.

   B. He was barking and racing around the deck.

   C. He sniffed the cargo carefully.

✔ D. He was very alert.

Reporting Category/Learning Standard for Item 7: ***Literature*/Learning Standard 9 (p. 49)**

8. The author uses the last paragraph of this story to

   A. explain why the men were so amazed that the dog had found his owner.

   B. provide examples of other pets who have traveled far to be reunited with their owners.

   C. describe the close ties between the man and his dog.

✔ D. suggest possible explanations for the dog's behavior.

Reporting Category/Learning Standard for Item 8: ***Literature*/Learning Standard 13 (p. 49)**

9. This is a nonfiction story because

✔ A. it is an account of actual events.

   B. it is a story that could not be true.

   C. the setting is provided in the first paragraph.

   D. the main character is an animal.

Reporting Category/Learning Standard for Item 9: ***Literature*/Learning Standard 10 (p. 49)**

Session 1, Open-Response Question

10. What are two clues that helped Hector find his way to his owner? Based on information from the story, explain how each clue helped Hector.

Reporting Category/Learning Standard for Item 10: ***Literature*/Learning Standard 9 (p. 49)**

Session 1, Reading Passage #2

Read the poem "Grandma Ling." Think about how the poet touches upon the past, present, and future. Answer the questions that follow.

GRANDMA LING

If you dig that hole deep enough,
you'll reach China, they used to tell me,
a child in a backyard in Pennsylvania.
Not strong enough to dig that hole,
I waited twenty years,
then sailed back, half way around the world.

In Taiwan I first met Grandma.
Before she came to view, I heard
her slippered feet softly measure
the tatami floor with even step;
the aqua paper-covered door slid open
and there I faced
my five foot height, sturdy legs and feet,
square forehead, high cheeks and wide-set eyes;
my image stood before me,
acted on by fifty years.

She smiled, stretched her arms
to take to heart the eldest daughter
of her youngest son a quarter century away.
She spoke a tongue I knew no word of,
and I was sad I could not understand,
but I could hug her.

—*Amy Ling*

Session 1, Multiple-Choice Questions

11. In lines 1 through 6, what is the poet's **main** focus?

    A. her childish misunderstandings

    B. her feeling of weakness

    C. her fear of going to China

✔ D. her desire to visit her ancestral home

Reporting Category/Learning Standard for Item 11: ***Literature*/Learning Standard 15 (p. 49)**

12. In lines 8 through 10, the poet writes, ". . . I heard / her slippered feet softly measure / the tatami floor . . ." The word *measure* is used to suggest

✔ A. careful movement.

    B. uncertainty.

    C. a sense of joy.

    D. the wisdom of old age.

Reporting Category/Learning Standard for Item 12: ***Literature*/Learning Standard 15 (p. 49)**

13. What is the poet's most striking impression of her grandmother upon first seeing her?

    A. Her grandmother is old.

✔ B. Her grandmother looks like her.

    C. Her grandmother is small.

    D. Her grandmother walks slowly.

Reporting Category/Learning Standard for Item 13: ***Literature*/Learning Standard 9 (p. 49)**

14. In line 15, the meaning of the word *image* is

    A. heart.

    B. dream.

✔ C. likeness.

    D. relative.

Reporting Category/Learning Standard for Item 14: ***Language*/Learning Standard 4 (p. 48)**

Session 1, Reading Passage #3

How would you recognize a fire ant mound in your neighborhood? Think about that question as you read the article entitled "Fire Ants on the March," and answer the questions that follow.

Fire Ants on the March

From *Washington Post* Magazine
by Scott Norvell

1 Ants thrive everywhere, except for a couple of islands and the North and South poles. Although they each weigh only 1/10,000 of an ounce, collectively they weigh more than all the human beings on earth. Ants are an essential part of the terrain, spreading seeds and adding vast quantities of nutrients to the soil. The garbage men of the insect world, they cart off and recycle 90 percent of the world's dead insects.

2 The ant's ant is the Amazon-bred *Solenopsis invicta*—from the Latin for "invincible." Its migration has been a natural phenomenon of awesome scale. It arrived in the United States early in this century through Mobile, Ala., likely carried on South American timber steamers. Soon it rode roughshod over 250 million acres in 11 states.

3 In the late 1940s farmers in Mississippi and Alabama began complaining about fire-ant mounds, built from the clayish soil, which hardened like two-foot boulders and tore up farm machinery. Eventually, fire ants were held responsible for killing chickens, plucking crops clean and even blinding infants.

4 That was just mythology—or mostly so. In fact, fire ants are defensive by nature. But they will storm anything that threatens their mound or looks like food, be it insects, injured waterfowl, newborn fawns or bedridden hospital patients. They latch on with barbed mandibles and sting repeatedly with spiked tails.

5 Fire-ant venom burns humans like a hot match and causes itchy blisters that persist for days if left alone, or weeks if scratched and infected. An unlucky one or two percent of the population is allergic to proteins in the poison and can go into shock. Deaths are very rare but they do occur, mainly among the very young and the old.

6 Beginning in the late 1950s, the federal government declared it would attempt to wipe out *S. invicta* once and for all. World War II-era bombers dusted millions of acres in the South with the highly poisonous pesticides dieldrin and heptachlor. Fire ants died, but so did birds, fish, dogs and cattle. When the program was finally halted, the government had spent $70 million, all in vain. Before the campaign, *S. invicta* had infested 90 million acres; five years later, they had spread to 126 million acres.

7 Frustrated but undaunted, the feds spent another $200 million in the 1960s for a new eradication effort, with similar dismal results. Today there are 157 chemical formulations registered for the control of fire ants—but nothing has stopped their spread.

8 If *S. invicta* are ever to be contained, the breakthrough will likely come at the Department of Agriculture's complex in Gainesville, Fla. There, on a steaming hot day, entomologist Dan Wojcik unloads buckets of dirt teeming with fire ants that he found in the surrounding countryside. He places a dripping hose over the swarms inside.

Fire ants have developed a unique method to keep from drowning. At first hint of rising water, worker ants gather the entire colony into a ball—sometimes as big as a basketball. As the
9 water overtakes the mound, the ball rides the flood like a living raft, rolling in the water so all can breathe. When they strike a solid object, be it a swimming dog or a canoe, they swarm aboard.

At Gainesville, the buckets' balled-up colonies are captured with a slotted spatula and slapped into deep plastic trays. Wojcik is study-
10 ing breeding and migration patterns, where fresh insights might give new direction to control programs.

In the South, he has learned, fire ants spread at a glacial but inexorable pace. During the summer, usually after a rain, hundreds of winged ants will ascend from their mounds to mate 500 feet in the air. The males drop to the ground and die, their purpose in life fulfilled. The females, now queens, drift downward to
11 start new colonies; on a windy day, this may be as far as five miles away. The queens burrow into holes and begin laying eggs. Two months later there will be several thousand, each queen laying 1500 eggs a day. In a year, a new colony can be 100,000 strong. The process repeats up to eight times each summer, spreading the ants 20 to 30 miles a year.

With the continuing migration of fire ants,
12 the Department of Agriculture is scrambling for that elusive solution to the problem once again. The latest scientific thinking is that by learning to communicate with the pests, man may ultimately figure out how to control them.

Robert Vander Meer, a colleague of Wojcik's, has spent the last 18 years isolating some of the chemicals used by fire ants to communicate. By decoding these compounds, scien-
13 tists may be able to interfere with what the ants tell each other, instructing them perhaps to pick up new, more effective baits or to kill their own queens, the only sure way of wiping out a colony.

Other scientists believe that cold weather will prove a natural barrier to large-scale migrations north. *S. invicta* eggs won't grow in tem-
14 peratures below 80° F., and the ants go into a coma of sorts when it's colder than 40° F. They can survive at 5° F. for only a few weeks and –3° F. for a few days, but die quickly after that.

Not everyone is so sure, however. A new hybrid form has popped up recently in Alabama, Georgia and Mississippi, seemingly able to with-
15 stand much colder winters. Also, *S. invicta* themselves may be developing cold tolerance: in the mountains of Tennessee, they have survived one of the region's coldest winters.

Meanwhile, pest-control officials continue their rounds, looking for new colonies and spreading their chemicals. Jim Pierce of the
16 Virginia Department of Agriculture and Consumer Services sums up the fire-ant situation simply: "As fast as we kill them, more just keep coming in."

Session 1, Multiple-Choice Questions

15. What result did the efforts to wipe out fire ants in the 1950s and 1960s have on their populations?

A. It stopped their spread and their populations stabilized.

B. It wiped them out, but only for a short time.

C. It only caused them to move to other states.

✔ D. It had little effect so their populations kept on spreading.

Reporting Category/Learning Standard for Item 15: ***Literature*/Learning Standard 9 (p. 49)**

16. How many times each summer do females leave fire-ant nests to start new nests on their own?

✔ A. 8

B. 25

C. 1500

D. 100,000

Reporting Category/Learning Standard for Item 16: ***Literature*/Learning Standard 9 (p. 49)**

17. In paragraph 12, the author states that "the Department of Agriculture is scrambling for that elusive solution to the problem once again." What does *elusive* mean?

A. exciting

✔ B. hard to find

C. easy to solve

D. confusing

Reporting Category/Learning Standard for Item 17: ***Language*/Learning Standard 4 (p. 48)**

18. Some scientists think that fire ants will stop spreading because they will

A. run out of cleared land.

✔ B. reach places that are too cold.

C. kill each other off.

D. attack their own queens.

Reporting Category/Learning Standard for Item 18: ***Literature*/Learning Standard 9 (p. 49)**

Session 1, Open-Response Question

19. The fire ant's Latin name *(Solenopsis invicta)* means invincible or undefeatable. Why is *invincible* a good term to describe fire ants? Explain your answer using information from the article.

*Reporting Category/*Learning Standard for Item 19: ***Literature/*Learning Standard 9 (p. 49)**

Session 2, Reading Passage #1

Stephen Crane wrote this essay to describe the lives of mules that worked in coal mines. As you read "In the Depths of a Coal Mine," think about the author's opinion of the conditions in which the mules lived. When you have finished reading, answer the questions that follow.

In the Depths of a Coal Mine

by Stephen Crane

Over in a wide and lightless room we found the mule stables. There we discovered a number of these animals standing with an air of calmness and self-possession that was somehow amazing to find in a mine. A little dark urchin came and belabored his mule "China" until he stood broadside to us that we might admire his innumerable fine qualities. The stable was like a dungeon. The mules were arranged in solemn rows. They turned their heads toward our lamps. The glare made their eyes shine wondrously like lenses. They resembled enormous rats.

1

About the room stood bales of hay and straw. The commonplace air worn by the long-eared slaves made it all infinitely usual. One had to wait to see the tragedy of it. It was not until we had grown familiar with the life and the traditions of the mines that we were capable of understanding the story told by these beasts standing in calm array, with spread legs.

2

It is a common affair for mules to be imprisoned for years in the limitless night of the mines. Our acquaintance, "China," had been four years buried. Upon the surface there had been the march of the seasons; the white splendor of snows had changed again and again to the glories of green springs. Four times had the earth been ablaze with the decorations of brilliant autumns. But "China" and his friends had remained in these dungeons from which daylight, if one could get a view up a shaft, would appear a tiny circle, a silver star aglow in a sable sky.

3

Usually when brought to the surface, the mules tremble at the earth radiant in the sunshine. Later, they go almost mad with fantastic joy. The full splendor of the heavens, the grass, the trees, the breezes, breaks upon them suddenly. They caper and career with extravagant mulish glee. A miner told me of a mule that had spent some delirious months upon the surface after years of labor in the mines. Finally the time came when he was to be taken back. But the memory of a black existence was upon him; he knew that gaping mouth that threatened to swallow him. No cudgelings could induce him. The men held conventions and discussed plans to budge that mule. The celebrated quality of obstinacy in him won him liberty to gambol clumsily about on the surface.

4

After being long in the mines, the mules are apt to duck and dodge at the close glare of lamps, but some of them have been known to have piteous fears of being left in the dead darkness. We met a boy who said that sometimes the only way he could get his team to move was to run ahead of them with the light. Afraid of the darkness, they would follow.

5

To those who have known the sunlight there may come the fragrant dream of a lost paradise. Perhaps this is what they brood over as they stand solemnly flapping their ears. Perhaps they despair and thirst for this bloomland that lies in an unknown direction and at impossible distances.

6

Session 2, Multiple-Choice Questions

20. The setting of this essay is **mostly** in a

    A. corral.

✔ B. mine.

    C. cavern.

    D. dungeon.

Reporting Category/Learning Standard for Item 20: ***Literature*/Learning Standard 13 (p. 49)**

21. In paragraph 1, what does *urchin* mean?

    A. dog

    B. owner

✔ C. child

    D. rat

Reporting Category/Learning Standard for Item 21: ***Language*/Learning Standard 4 (p. 48)**

22. In paragraph 3, the author uses images of changing seasons. What do these images convey about the mules' existence?

    A. The mules had been in the mines while time quickly passed.

    B. The mules were protected from the weather in the mines.

    C. The mules did not miss the changes in the outside world.

✔ D. The mules did not experience the beauties outside the mine.

Reporting Category/Learning Standard for Item 22: ***Literature*/Learning Standard 15 (p. 49)**

23. In paragraph 4, the author says the mules "caper and career with extravagant mulish glee." What does *career* mean in this sentence?

✔ A. gallop briskly

    B. work efficiently

    C. look about

    D. cry out in fear

Reporting Category/Learning Standard for Item 23: ***Literature*/Learning Standard 8 (p. 49)**

24. Which quotation best summarizes the story in paragraph 4?

A. "The difference between the almost right word and the right word is really a large matter—it's the difference between the lightning bug and the lightning." — *Mark Twain*

B. "Nothing great was ever achieved without enthusiasm." — *Ralph Waldo Emerson*

✔ C. "Freedom suppressed and then regained bites with keener fangs than freedom never endangered." — *Cicero*

D. "Nature, like a kind and smiling mother, lends herself to our dreams and cherishes our fancies." — *Victor Hugo*

Reporting Category/Learning Standard for Item 24: ***Literature*/Learning Standard 13 (p. 49)**

25. In paragraph 6, the author makes up the word "bloomland" to refer to the

A. stable in the coal mine.

B. inner memories of the mules.

✔ C. world aboveground.

D. lantern room.

Reporting Category/Learning Standard for Item 25: ***Literature*/Learning Standard 15 (p. 49)**

26. The essay tells about a mule that refused to return to the mine after several months of freedom and was allowed to remain on the surface. How did this happen?

A. The mule broke his leg in the struggle and was worthless in the mines.

✔ B. The mule was too stubborn, and the miners would not force him.

C. The miners decided they did not need the mule because he was too old.

D. The miners had already decided to free him because he was unruly.

Reporting Category/Learning Standard for Item 26: ***Literature*/Learning Standard 9 (p. 49)**

27. What two contrasting conditions provide the topic for this essay?

A. knowledge and ignorance

B. work and play

C. obedience and stubbornness

✔ D. imprisonment and freedom

Reporting Category/Learning Standard for Item 27: ***Literature*/Learning Standard 11 (p. 49)**

Session 2, Open-Response Question

28. What is the author's opinion of the conditions in which the mules live in the mine? Use examples from the essay to explain how the author uses descriptive language to convey his opinion.

Reporting Category/Learning Standard for Item 28: ***Literature*/Learning Standard 15 (p. 49)**

Session 3, Reading Passage #1

As you read this story, think about what author James Thurber is saying about people. Answer the questions that follow.

The Princess and the Tin Box

by James Thurber

Once upon a time, in a far country, there lived a king whose daughter was the prettiest princess in the world. Her eyes were like the cornflower, her hair sweeter than the hyacinth, and her throat made the swan look dusty.

1

From the time she was a year old, the princess had been showered with presents. Her nursery looked like Cartier's[1] window. Her toys were all made of gold or platinum or diamonds or emeralds. She was not permitted to have wooden blocks or china dolls or rubber dogs or linen books, because such materials were considered cheap for the daughter of a king.

2

When she was seven, she was allowed to attend the wedding of her brother and throw real pearls at the bride instead of rice. Only the nightingale, with his lyre of gold, was permitted to sing for the princess. The common blackbird, with his boxwood flute, was kept out of the palace grounds. She walked in silver-and-samite[2] slippers to a sapphire-and-topaz bathroom and slept in an ivory bed inlaid with rubies.

3

On the day the princess was eighteen, the king sent a royal ambassador to the courts of five neighboring kingdoms to announce that he would give his daughter's hand in marriage to the prince who brought her the gift she liked the most.

4

The first prince to arrive at the palace rode a swift white stallion and laid at the feet of the princess an enormous apple made of solid gold which he had taken from a dragon who had guarded it for a thousand years. It was placed on a long ebony table set up to hold the gifts of the princess's suitors. The second prince, who came on a gray charger, brought her a nightingale made of a thousand diamonds, and it was placed beside the golden apple. The third prince, riding on a black horse, carried a great jewel box made of platinum and sapphires, and it was placed next to the diamond nightingale. The fourth prince, astride a fiery yellow horse, gave the princess a gigantic heart made of rubies and pierced by an emerald arrow. It was placed next to the platinum-and-sapphire jewel box.

5

Now the fifth prince was the strongest and handsomest of all the five suitors, but he was the son of a poor king whose realm had been

6

1. Cartier's (kär-tyāz′): a store that sells very expensive jewelry, located in New York City.

2. samite (sā′mīt′): a silk fabric

overrun by mice and locusts and wizards and mining engineers so that there was nothing much of value left in it. He came plodding up to the palace of the princess on a plow horse and he brought her a small tin box filled with mica and feldspar and hornblende[3] which he had picked up on the way.

The other princes roared with disdainful laughter when they saw the tawdry[4] gift the fifth prince had brought to the princess. But she examined it with great interest and squealed
7 with delight, for all her life she had been glutted with precious stones and priceless metals, but she had never seen tin before or mica or feldspar or hornblende. The tin box was placed next to the ruby heart pierced with an emerald arrow.

"Now," the king said to his daughter, "you
8 must select the gift you like best and marry the prince that brought it."

3. mica; feldspar; hornblende: three kinds of ordinary rock.

4. tawdry (tȯ′drē): cheap and flashy.

The princess smiled and walked up to the
9 table and picked up the present she liked the most. It was the platinum-and-sapphire jewel box, the gift of the third prince.

"The way I figure it," she said, "is this. It is a very large and expensive box, and when I am married, I will meet many admirers who
10 will give me precious gems with which to fill it to the top. Therefore, it is the most valuable of all the gifts my suitors have brought me and I like it the best."

The princess married the third prince that very day in the midst of great merriment and
11 high revelry. More than a hundred thousand pearls were thrown at her and she loved it.

Moral: All those who thought the princess was going to select the tin box filled with worthless stones instead of one of the other
12 *gifts will kindly stay after class and write one hundred times on the blackboard, "I would rather have a hunk of aluminum silicate than a diamond necklace."*

Session 3, Multiple-Choice Questions

29. What is the theme of this story?

A. What you like may not be good for you.

✔ B. People are influenced by how they are raised.

C. Every cloud has a silver lining.

D. It is better to give than to receive.

Reporting Category/Learning Standard for Item 29: ***Literature*/Learning Standard 11 (p. 49)**

30. In paragraph 1, which literary device does the author use when he says, "Her eyes were like the cornflower"?

✔ A. simile

B. consonance

C. alliteration

D. onomatopoeia

Reporting Category/Learning Standard for Item 30: ***Literature*/Learning Standard 15 (p. 49)**

31. In paragraph 5, the word *ebony* means

A. flat.

✔ B. black.

C. rectangular.

D. blue.

Reporting Category/Learning Standard for Item 31: ***Language*/Learning Standard 4 (p. 48)**

32. In paragraph 7, what does *disdainful* mean?

A. playful

✔ B. scornful

C. hopeful

D. frightful

Reporting Category/Learning Standard for Item 32: ***Literature*/Learning Standard 8 (p. 49)**

33. In paragraph 12, a "hunk of aluminum silicate" refers to

A. an uncut diamond.

B. a priceless metal.

✔ C. a worthless stone.

D. a piece of crystal.

Reporting Category/Learning Standard for Item 33: ***Literature*/Learning Standard 8 (p. 49)**

34. The reader expects the princess to choose the fifth prince for her husband for all of the following reasons **except** that the

A. princess is delighted when she sees the contents of the tin box.

B. fifth prince is the most handsome.

C. fifth prince is the strongest.

✔ D. princess feels sorry for him when the others laugh at him.

Reporting Category/Learning Standard for Item 34: ***Literature*/Learning Standard 9 (p. 49)**

35. In choosing the gift from the third prince, the princess showed that she **most likely**

A. found him the most handsome of all.

B. followed her heart.

✔ C. cared more about things than people.

D. would always do as her father wished.

Reporting Category/Learning Standard for Item 35: ***Literature*/Learning Standard 9 (p. 49)**

36. This story uses elements of two different genres—fairy tale and

✔ A. fable.

B. mystery.

C. myth.

D. legend.

Reporting Category/Learning Standard for Item 36: ***Literature*/Learning Standard 10 (p. 49)**

Session 3, Open-Response Question

37. In this story, what does the author seem to be saying about people? Explain your answer using information from the story.

Reporting Category/Learning Standard for Item 37: ***Literature*/Learning Standard 15 (p. 49)**

Session 3, Reading Passage #2

Read a chapter from Maya Angelou's autobiographical essay entitled, "Wouldn't Take Nothing For My Journey Now," which describes events from the author's childhood. Answer the questions that follow.

Complaining

by Maya Angelou

When my grandmother was raising me in Stamps, Arkansas, she had a particular routine when people who were known to be whiners entered her store. Whenever she saw a
1 known complainer coming, she would call me from whatever I was doing and say conspiratorially, "Sister, come inside. Come." Of course I would obey.

My grandmother would ask the customer, "How are you doing today, Brother Thomas?" And the person would reply, "Not so good." There would be a distinct whine in the voice. "Not so good today, Sister Henderson. You see, it's this summer. It's this summer heat. I just
2 hate it. Oh, I hate it so much. It just frazzles me up and frazzles me down. I just hate the heat. It's almost killing me." Then my grandmother would stand stoically, her arms folded, and mumble, "Uh-huh, uh-huh." And she would cut her eyes at me to make certain that I had heard the lamentation.

At another time a whiner would mewl, "I hate plowing. That packed-down dirt ain't got no reasoning, and mules ain't got good sense. . . . Sure ain't. It's killing me. I can't never seem
3 to get done. My feet and hands stay sore, and I get dirt in my eyes and up my nose. I just can't stand it." And my grandmother, again stoically with her arms folded, would say, "Uh-huh, uh-huh," and then look at me and nod.

As soon as the complainer was out of the store, my grandmother would call me to stand in front of her. And then she would say the same thing she had said at least a thousand times, it seemed to me. "Sister, did you hear what Brother So-and-So or Sister Much to Do complained about? You heard that?" And I would nod. Mamma would continue, "Sister, there are people who went to sleep all over the world last night, poor and rich and white and black, but never
4 wake again. Sister, those who expected to rise did not, their beds became their cooling boards, and their blankets became their winding sheets. And those dead folks would give anything, anything at all for just five minutes of this weather or ten minutes of that plowing that person was grumbling about. So you watch yourself about complaining, Sister. What you're supposed to do when you don't like a thing is change it. If you can't change it, change the way you think about it. Don't complain."

It is said that persons have few teachable moments in their lives. Mamma seemed to have
5 caught me at each one I had between the age of three and thirteen. Whining is not only graceless, but can be dangerous. It can alert a brute that a victim is in the neighborhood.

Session 3, Multiple-Choice Questions

38. How did the narrator's grandmother feel about people like Brother Thomas?

✔ A. disapproving

B. sympathetic

C. sorry

D. puzzled

Reporting Category/Learning Standard for Item 38: ***Literature*/Learning Standard 9 (p. 49)**

39. The author writes, "'I hate plowing. That packed-down dirt ain't got no reasoning, and mules ain't got good sense. . . . Sure ain't.'" The author **most likely** uses dialect in order to

A. emphasize the negative aspects of plowing.

B. give an eyewitness account of an historical event.

C. describe the reasons why people complained.

✔ D. make the conversation appear more realistic.

Reporting Category/Learning Standard for Item 39: ***Language*/Learning Standard 6 (p. 48)**

40. In paragraph 4, the references to "cooling boards" and "winding sheets" are the grandmother's way of saying that the people she is talking about are

A. waiting.

B. lazy.

C. sleeping.

✔ D. dead.

Reporting Category/Learning Standard for Item 40: ***Literature*/Learning Standard 15 (p. 49)**

41. The author's last paragraph gives this warning: "Whining is not only graceless, but can be dangerous." What does the author mean by this?

A. Complaining can cause people who might otherwise like you to avoid you.

B. If you complain too much, you will not get much done.

✔ C. Complaining suggests weakness, so people might mistreat you.

D. If you complain too much, you will become old before your time.

Reporting Category/Learning Standard for Item 41: ***Literature*/Learning Standard 15 (p. 49)**

IV. English Language Arts, Grade 10

A. Composition
B. Language and Literature

English Language Arts, Grade 10
A. Composition

The spring 2000 MCAS English Language Arts Composition test was based on the learning standards of the *Composition* strand of the Massachusetts *English Language Arts Curriculum Framework* (1997).

Curriculum Framework *Learning Standards*

The learning standards for the *Composition* strand are listed below and are directly quoted from the *Framework;* applicable *Framework* page numbers are shown in parentheses.

Composition (*Framework,* pp. 56–60)

Learning Standard 19

Students will write compositions with a clear focus, logically related ideas to develop it, and adequate detail.

Learning Standard 20

Students will select and use appropriate genres, modes of reasoning, and speaking styles when writing for different audiences and rhetorical purposes.

Learning Standard 21

Students will demonstrate improvement in organization, content, paragraph development, level of detail, style, tone, and word choice (diction) in their compositions after revising them.

Learning Standard 22

Students will use knowledge of standard English conventions to edit their writing.

MCAS Reporting Category

In *Test Item Analysis Reports* and on the *Subject Area Subscore* pages of the MCAS *School* and *District Reports,* ELA Composition test results are reported under the MCAS **reporting category** of Composition.

MCAS Spring 2000 Common Test Items
ELA Composition, Grade 10

Test Sessions

MCAS ELA Composition Student Test Booklets included 2 separate test sessions, administered on the same day with a short break between sessions. During the first session, each student wrote a first draft of a composition in response to the following writing prompt. During the second session, each student revised his/her first draft and submitted his/her second draft for scoring.

Reference Materials and Tools

At least one dictionary per classroom was provided for student use during ELA Composition test sessions. No other reference materials or tools were allowed during either ELA Composition test session.

Cross-Reference Information

The shaded bar following the writing prompt indicates this item's MCAS reporting category and which *Framework* learning standards it assesses.

Grade 10 Writing Prompt

1. Writing Assignment

Often in works of literature, there are characters—other than the main character—whose presence in the work is essential.

From a work of literature you have read in or out of school, select a character, other than the main character, who plays a key role. In a well-developed composition, identify the character and explain why this character is important.

Reporting Category/Learning Standards for Item 1: ***Composition*/Learning Standards 19-22 (p. 77)**

English Language Arts, Grade 10
B. Language and Literature

The spring 2000 MCAS English Language Arts Language and Literature test was based on the learning standards of two content strands of the Massachusetts *English Language Arts Curriculum Framework* (1997):

- Language
- Literature

Curriculum Framework *Learning Standards*

The learning standards for the *Language* and *Literature* strands are listed below and are directly quoted from the *Framework;* applicable *Framework* page numbers are shown in parentheses.

Language (*Framework,* pp. 28–31)

Learning Standard 4

Students will acquire and use correctly an advanced reading vocabulary of English words, identifying meanings through an understanding of word relationships.

Learning Standard 5

Students will identify, describe, and apply knowledge of the structure of the English language and standard English conventions for sentence structure, usage, punctuation, capitalization, and spelling.

Learning Standard 6

Students will describe and analyze how oral dialects differ from each other in English, how they differ from written standard English, and what role standard American English plays in informal and formal communication.

Learning Standard 7

Students will describe and analyze how the English language has developed and been influenced by other languages.

Literature (*Framework*, pp. 38–50)

Learning Standard 8

Students will decode accurately and understand new words encountered in their reading materials, drawing on a variety of strategies as needed, and then use these words accurately in . . . writing.

Learning Standard 9

Students will identify the basic facts and essential ideas in what they have read, heard, or viewed.

Learning Standard 10

Students will identify, analyze, and apply knowledge of the characteristics of different genres.

Learning Standard 11

Students will identify, analyze, and apply knowledge of theme in literature and provide evidence from the text to support their understanding.

Learning Standard 12

Students will identify, analyze, and apply knowledge of the structure and elements of fiction and provide evidence from the text to support their understanding.

Learning Standard 13

Students will identify, analyze, and apply knowledge of the structure, elements, and meaning of nonfiction or informational material and provide evidence from the text to support their understanding.

Learning Standard 14

Students will identify, analyze, and apply knowledge of the structure, elements, and theme of poetry and provide evidence from the text to support their understanding.

Learning Standard 15

Students will identify and analyze how an author's choice of words appeals to the senses, creates imagery, suggests mood, and sets tone.

Learning Standard 16

Students will compare and contrast similar myths and narratives from different cultures and geographic regions.

Learning Standard 17

Students will interpret the meaning of literary works, nonfiction, films, and media by using different critical lenses and analytic techniques.

MCAS Reporting Categories

In *Test Item Analysis Reports* and on the *Subject Area Subscore* pages of the MCAS *School* and *District Reports,* ELA Language and Literature test results are reported under the following two MCAS reporting categories:

- Language
- Literature

MCAS Spring 2000 Common Test Items
ELA Language and Literature, Grade 10

Test Sessions

MCAS ELA Language and Literature Student Test Booklets included 3 separate test sessions. Each session included selected readings, followed by multiple-choice and open-response questions.

Reference Materials and Tools

No reference materials or tools were allowed during any ELA Language and Literature test session.

Cross-Reference Information

The shaded bar underneath each item indicates the item's MCAS reporting category and which *Framework* learning standard it assesses. The parentheses indicate the page in this document where the learning standard may be found.

Session 1, Reading Passage #1

The following excerpt is from The Perfect Storm, *a book about a devastating 1991 storm, by Sebastian Junger. Read the excerpt and answer the questions that follow.*

from The Perfect Storm

by Sebastian Junger

All collapsed, and the great shroud
of the sea rolled on as it had
five thousand years ago.

—Herman Melville, *Moby Dick*

BY the time word has spread throughout Gloucester that the fleet's in trouble, the storm has retrograded to within 350 miles of Cape Cod and developed such a steep pressure gradient that an eye starts to form. Satellite photos show a cyclonic swirl two thousand miles wide off the East Coast; the southern edge reaches Jamaica and the northern edge reaches the coast of Labrador. In all, three quarters of a million square miles of ocean are experiencing gale-force conditions, and an area three or four times that is indirectly involved in the storm. On
1 the satellite photos, moist air flowing into the low looks like a swirl of cream in a cup of black coffee. Thick strands of white cloud-cover and dark Arctic air circle one-and-a-half times around the low before making it into the center. The low grinds steadily toward the coast, intensifying as it goes, and by the morning of October 30th it has stalled two hundred miles south of Montauk, Long Island. The worst winds, in the northeast quadrant, are getting dragged straight across Gloucester Harbor and Massachusetts Bay.

So sudden and violent are the storm's first caresses of the coast that a tinge of hysteria creeps into the local weather bulletins: UNCONFIRMED REPORTS OF TWO HOUSES COLLAPSING HAVE BEEN RECEIVED FROM THE
2 GLOUCESTER AREA...OTHER MASSACHUSETTS LOCATIONS UNDER THE GUN...SEAS OF 25 TO 45 FEET HAVE OCCURRED TODAY FROM GEORGES BANK EAST...THE DANGEROUS STORM ASSOCIATED WITH HIGH SEAS IS MOVING SOUTHEAST CLOSER TO NEW ENGLAND.

The first coastal flood warnings are issued at 3:15AM on the 29th, based mainly on reports from Nantucket of sustained winds up to 45 knots. Predictions from the Weather Service's computers are systematically exceeding almost all atmospheric models for the area, and high tides are predicted to be two to three feet above normal. (These predictions, as it turns out, will be way too low.) The warnings go out via satellite uplink along something called the NOAA Weather Wire, which feeds into local media and emergency services. By dawn, radio and television announcers are informing the
3 public about the oncoming storm, and the state Emergency Management Agency is contacting local authorities along the coast to make sure they take precautions. The EMA is based in Framingham, Massachusetts, outside of Boston, and has direct lines to Governor Weld's Office, the National Guard, the State Police barracks, and the National Weather Service. Any threat to the public health is routed through the EMA. If local communities don't have the resources to cope, state agencies step in; if state agencies can't handle it, the federal government gets called. The EMA is set up to handle everything from severe thunderstorms to nuclear war.

October 30th, on shore, is deceptively calm and mild; oak leaves skitter down the street and the midday sun has a thin warmth to it that people won't feel again until spring. The only sign that something is

amiss is along the coast, where huge grey swells start to roll in that can be heard miles inland. Swells are the outriders of sea weather, and if they keep getting bigger, the weather is approaching. The Gloucester Police Department blocks access to the shore but people go anyway, parking their cars half a mile away and walking through the rising wind and rain to hilltops where they can look out to sea. They are greeted by an ocean that has been wholly transformed. Swells march shoreward from the horizon in
4 great, even bands, their white crests streaming sideways in the wind and their ranks breaking, reforming, and breaking again as they close in on Cape Ann. In the shallows they draw themselves up, hesitate, and then implode against the rocks with a force that seems to shake the entire peninsula. Air trapped inside their grey barrels gets blown out the back walls in geysers higher than the waves themselves. Thirty-foot seas are rolling in from the North Atlantic and attacking the town of Gloucester with a cold, heavy rage.

By midafternoon the wind is hitting hurricane force and people are having a hard time walking, standing up, being heard. Moans emanate from the electric lines that only off-shore fishermen have ever heard before. Waves inundate Good Harbor Beach and the parking lot in front of the Stop-n-Shop. They rip up entire sections of Atlantic Road. They deposit a fifteen-foot-high tangle of lobster traps and sea muck at the end of Grapevine Road. They fill the
5 swimming pool of a Back Shore mansion with ocean-bottom rubble. They suck beach cobbles up their huge faces and sling them inland, smashing windows, peppering lawns. They overrun the sea wall at Brace Cove, spill into Niles Pond, and continue into the woods beyond. For a brief while it's possible to surf across people's lawns. So much salt water gets pumped into Niles Pond that it overflows and cuts Eastern Point in half. Eastern Point is where the rich live, and by nightfall the ocean is two feet deep in some of the nicest living rooms in the state.

In several places around the state, houses float off their foundations and out to sea. Waves break through a thirty-foot sand dune at Ballston Beach in Truro and flood the headwaters of the Pamet River. Six-thousand-pound boat moorings drag inside Chatham Harbor. The Pilgrim Nuclear Power Plant...shuts down because seaweed clogs the condenser intakes. A Delta Airlines pilot at Logan is surprised to see spray from breaking waves top the two-hundred-foot cranes on Deer Island; just sitting on the runway, his airspeed indicator clocks eighty miles an hour. Houses are washed out to sea in Gloucester,
6 Swampscott, and on Cape Cod. Rising waters inundate half of the town of Nantucket. A man is swept off the rocks in Point Judith, Rhode Island, and is never seen again, and a surfer dies trying to ride twenty-foot shorebreak in Massachusetts. Plum Island is cut in half by the waves, as is Hough's Neck and Squantum, in Quincy. Over one hundred houses are destroyed in the town of Scituate, and the National Guard has to be called out to help the inhabitants evacuate. One elderly woman is taken from her house by a backhoe while surf breaks down her front door.

The winds have set so much water in motion that the ocean gets piled up against the continent and starts blocking the rivers. The Hudson backs up one hundred miles to Albany and causes flooding, and the Potomac does the same. Tides are five feet above normal in Boston Harbor, within one inch of an all-time Boston record. Had the storm occurred a week earlier, during the highest tides of the month, water
7 levels would be a foot and a half higher, flooding downtown Boston. Storm surge and huge seas extinguish Isle of Shoals and Boone's Island lighthouses off the coast of Maine. Some Democrats are cheered to see waves obliterate the front of President Bush's summer mansion in Kennebunkport. Damage along the East Coast surpasses one and a half billion dollars, including millions of dollars in lobster pots and other fixed fishing gear.

"The only light I can shed on the severity of the storm is that until then, we had never—ever—had a
8 lobster trap move offshore," says Bob Brown. "Some were moved thirteen miles to the west. It was the worst storm I have ever heard of, or experienced."

Session 1, Multiple-Choice Questions

2. The author builds the drama in this excerpt through the use of all of the following **except**

   A. vivid imagery.

   B. present tense.

   C. action verbs.

✔ D. rhetorical questions.

Reporting Category/Learning Standard for Item 2: ***Literature*/Learning Standard 15 (p. 81)**

3. In paragraph 2, why is one section capitalized?

   A. because it is the most important information of the excerpt

✔ B. to emphasize the tone of the local weather bulletins

   C. to warn people to move inland before the storm

   D. because meteorologists were hysterical with fear when they wrote it

Reporting Category/Learning Standard for Item 3: ***Literature*/Learning Standard 13 (p. 81)**

4. According to this excerpt, when does the federal government get involved with a potential natural emergency?

   A. at the first forecast of a storm

   B. after local communities exhaust their resources

✔ C. when state agencies cannot cope with the emergency

   D. only after the situation is declared a disaster

Reporting Category/Learning Standard for Item 4: ***Literature*/Learning Standard 9 (p. 81)**

5. Which dictionary definition fits *swell* as it is used in paragraph 4?

✔ A. unbroken series of waves

   B. tract of rising ground

   C. conspicuous, fashionable person

   D. a bulge; protuberance

Reporting Category/Learning Standard for Item 5: ***Literature*/Learning Standard 8 (p. 81)**

6. In paragraph 5, what does *inundate* mean?

✔ A. flood

B. destroy

C. pound

D. churn

Reporting Category/Learning Standard for Item 6: ***Literature*/Learning Standard 8 (p. 81)**

7. What is the subject of the sentence "In several places around the state, houses float off their foundations and out to sea"?

A. places

B. state

✔ C. houses

D. sea

Reporting Category/Learning Standard for Item 7: ***Language*/Learning Standard 5 (p. 80)**

8. What factor prevented this storm from causing even more damage?

A. seawalls

✔ B. lower tides

C. sand dunes

D. mild winds

Reporting Category/Learning Standard for Item 8: ***Literature*/Learning Standard 9 (p. 81)**

9. Information in this excerpt is presented

A. spatially.

B. metaphorically.

C. haphazardly.

✔ D. chronologically.

Reporting Category/Learning Standard for Item 9: ***Literature*/Learning Standard 13 (p. 81)**

Session 1, Open-Response Question

10. Explain how the quotation by Herman Melville is appropriate for this excerpt. Use specific evidence from the text to support your explanation.

Reporting Category/Learning Standard for Item 10: ***Literature*/Learning Standard 11 (p. 81)**

Session 1, Reading Passage #2

The following poem is by American poet Robert Frost. As you read the poem, pay attention to poetic structure and theme. When you have finished reading, answer the questions that follow.

Acquainted with the Night

I have been one acquainted with the night.
I have walked out in rain—and back in rain.
I have outwalked the furthest city light.

I have looked down the saddest city lane.
I have passed by the watchman on his beat
And dropped my eyes, unwilling to explain.

I have stood still and stopped the sound of feet
When far away an interrupted cry
Came over houses from another street,

But not to call me back or say good-by;
And further still at an unearthly height
One luminary clock against the sky

Proclaimed the time was neither wrong nor right.
I have been one acquainted with the night.

—*Robert Frost*

Session 1, Multiple-Choice Questions

11. The last line of the first stanza, "I have outwalked the furthest city light," suggests that the

A. speaker's vision is impaired by the rain.

B. speaker walks only in total darkness.

C. speaker sees the lights turned off.

✔ D. speaker walks great distances in the night.

Reporting Category/Learning Standard for Item 11: ***Literature*/Learning Standard 14 (p. 81)**

12. In line 6, the **best** reason the speaker is "unwilling to explain" is that he

✔ A. does not want to share his reasons for walking at night.

B. does not belong in the watchman's neighborhood.

C. is afraid the watchman may harm him if he speaks.

D. is preoccupied with the sight of a sad city lane.

Reporting Category/Learning Standard for Item 12: ***Literature*/Learning Standard 14 (p. 81)**

13. In line 12, *luminary* means

A. solitary.

B. towering.

✔ C. glowing.

D. mysterious.

Reporting Category/Learning Standard for Item 13: ***Language*/Learning Standard 4 (p. 80)**

14. With which of the following stanza patterns does the poem end?

A. quatrain

B. sestet

C. octave

✔ D. couplet

Reporting Category/Learning Standard for Item 14: ***Literature*/Learning Standard 14 (p. 81)**

Session 1, Reading Passage #3

The following selection is an excerpt from a chapter of Rachel Carson's book The Sea Around Us. *As you read, notice how the author uses literary language to emphasize her theme in this nonfiction essay. When you have finished reading, answer the questions that follow.*

The Changing Year

by Rachel Carson

"Thus with the Year Seasons return."
—Milton

1 Autumn comes to the sea with a fresh blaze of phosphorescence, when every wave crest is aflame. Here and there the whole surface may glow with sheets of cold fire, while below schools of fish pour through the water like molten metal. Often the autumnal phosphorescence is caused by a fall flowering of the dinoflagellates*, multiplying furiously in a short-lived repetition of their vernal blooming.

2 Sometimes the meaning of the glowing water is ominous. Off the Pacific coast of North America, it may mean that the sea is filled with the dinoflagellate Gonyaulax, a minute plant that contains a poison of strange and terrible virulence. About four days after Gonyaulax comes to dominate the coastal plankton, some of the fishes and shellfish in the vicinity become toxic. This is because, in their normal feeding, they have strained the poisonous plankton out of the water. Mussels accumulate the Gonyaulax toxins in their livers, and the toxins react on the human nervous system with an effect similar to that of strychnine. Because of these facts, it is generally understood along the Pacific coast that it is unwise to eat shellfish taken from coasts exposed to the open sea where Gonyaulax may be abundant, in summer or early fall. For generations before the white men came, the Indians knew this. As soon as the red streaks appeared in the sea and the waves began to flicker at night with the mysterious blue-green fires, the tribal leaders forbade the taking of mussels until these warning signals should have passed. They even set guards at intervals along the beaches to warn inlanders who might come down for shellfish and be unable to read the language of the sea.

3 But usually the blaze and glitter of the sea, whatever its meaning for those who produce it, implies no menace to man. Seen from the deck of a vessel in open ocean, a tiny, man-made observation point in the vast world of sea and sky, it has an eerie and unearthly quality. Man, in his vanity, subconsciously attributes a human origin to any light not of moon or stars or sun. Lights on the shore, lights moving over the water, mean lights kindled and controlled by other men, serving purposes understandable to the human mind. Yet here are lights that flash and fade away, lights that come and go for reasons meaningless to man, lights that have been doing this very thing over the eons of time in which there were no men to stir in vague disquiet.

*dinoflagellates – algae-type marine organisms

Session 1, Multiple-Choice Questions

15. The quotation by Milton is an example of

    A. an appendix.

✔ B. an epigraph.

    C. an oxymoron.

    D. a metaphor.

Reporting Category/Learning Standard for Item 15: ***Literature*/Learning Standard 13 (p. 81)**

16. In the first paragraph, the phrase "schools of fish pour through the water like molten metal" is an example of

✔ A. simile.

    B. irony.

    C. personification.

    D. onomatopoeia.

Reporting Category/Learning Standard for Item 16: ***Literature*/Learning Standard 15 (p. 81)**

17. In the first sentence of paragraph 2, the word *ominous* means

    A. omnipotent.

✔ B. threatening.

    C. flaming.

    D. blazing.

Reporting Category/Learning Standard for Item 17: ***Language*/Learning Standard 4 (p. 80)**

18. According to this excerpt, the coastal Indians of the Northwest became aware of the danger of eating shellfish by

    A. being warned by inland inhabitants.

    B. noticing when shellfish started to die.

✔ C. observing the red streaks and phosphorescence in the water.

    D. seeing warning signals from Indians further down the coast.

Reporting Category/Learning Standard for Item 18: ***Literature*/Learning Standard 9 (p. 81)**

Session 1, Open-Response Question

19. The author uses both literary and scientific language in this excerpt. Choose one example of literary language and one example of scientific language and explain how each contributes to the development of the excerpt.

*Reporting Category/*Learning Standard for Item 19: ***Literature/*Learning Standard 15 (p. 81)**

Session 2, Reading Passage #1

This essay is a short memoir by Jesús Colón and details the difficulties endured by a young Hispanic man working in New York City in the early part of the 20th century. Read the memoir and answer the questions that follow.

Kipling and I

by Jesús Colón

1 Sometimes I pass Debevoise Place at the corner of Willoughby Street . . . I look at the old wooden house, gray and ancient, the house where I used to live some forty years ago . . .

2 My room was on the second floor at the corner. On hot summer nights I would sit at the window reading by the electric light from the street lamp which was almost at a level with the windowsill.

3 It was nice to come home late during the winter, look for some scrap of old newspaper, some bits of wood and a few chunks of coal, and start a sparkling fire in the chunky fourlegged coal stove. I would be rewarded with an intimate warmth as little by little the pigmy stove became alive puffing out its sides, hot and red, like the crimson cheeks of a Santa Claus.

4 My few books were in a soap box nailed to the wall. But my most prized possession in those days was a poem I had bought in a five-and-ten-cent store on Fulton Street. (I wonder what has become of these poems, maxims and sayings of wise men that they used to sell at the five-and-ten-cent stores?) The poem was printed on gold paper and mounted in a gilded frame ready to be hung in a conspicuous place in the house. I bought one of those fancy silken picture cords finishing in a rosette to match the color of the frame.

5 I was seventeen. The poem to me then seemed to summarize, in one poetical nutshell, the wisdom of all the sages that ever lived. It was what I was looking for, something to guide myself by, a way of life, a compendium of the wise, the true and the beautiful. All I had to do was live according to the counsel of the poem and follow its instructions and I would be a perfect man—the useful, the good, the true human being. I was very happy that day, forty years ago.

6 The poem had to have the most prominent place in the room. Where could I hang it? I decided that the best place for the poem was on the wall right by the entrance to the room. No one coming in and out would miss it. Perhaps someone would be interested enough to read it and drink the profound waters of its message . . .

7 Every morning as I prepared to leave, I stood in front of the poem and read it over and over again, sometimes half a dozen times. I let the sonorous music of the verse carry me away. I brought with me a handwritten copy as I stepped out every morning looking for work, repeating verses and stanzas from memory until the whole poem came to be part of me. Other days my lips kept repeating a single verse of the poem at intervals throughout the day.

8 In the subways I loved to compete with the shrill noises of the many wheels below by chanting the lines of the poem. People stared at me moving my lips as though I were in a trance. I looked back with pity. They were not so fortunate as I who had as a guide to direct my life a great poem to make me wise, useful and happy.

And I chanted:

9 *If you can keep your head when all about you*
Are losing theirs and blaming it on you . . .

If you can wait and not be tired by waiting,
Or being lied about, don't deal in lies,
Or being hated don't give way to hating . . .

If you can make one heap of all your winnings;
And risk it on one turn of pitch-and-toss,
And lose, and start again at your beginnings . . .

"If—," by Kipling, was the poem. At seventeen, my evening prayer and my first morning thought. I
10 repeated it every day with the resolution to live up to the very last line of that poem.

I would visit the government employment office on Jay Street. The conversations among the Puerto Ricans on the large wooden benches in the employment office were
11 always on the same subject. How to find a decent place to live. How they would not rent to Negroes or Puerto Ricans. How Negroes and Puerto Ricans were given the pink slips first at work.

From the employment office I would call door to door at the piers, factories and storage houses in the streets under
12 the Brooklyn and Manhattan bridges. "Sorry, nothing today." It seemed to me that that "today" was a continuation and combination of all the yesterdays, todays and tomorrows.

From the factories I would go to the restaurants, look-
13 ing for a job as a porter or dishwasher. At least I would eat and be warm in a kitchen.

14 "Sorry" . . . "Sorry" . . .

Sometimes I was hired at ten dollars a week, ten hours a day including Sundays and holidays. One day off during the week. My work was that of three men: dishwasher,
15 porter, busboy. And to clear the sidewalk of snow and slush "when you have nothing else to do." I was to be appropriately humble and grateful not only to the owner but to everybody else in the place.

If I rebelled at insults or at a pointed innuendo or just the inhuman amount of work, I was unceremoniously
16 thrown out and told to come "next week for your pay." "Next week" meant weeks of calling for the paltry dollars owed me. The owners relished this "next week."

I clung to my poem as to a faith. Like a potent amulet,
17 my precious poem was clenched in the fist of my right hand inside my secondhand overcoat. Again and again I declaimed aloud a few precious lines when discouragement and disillusionment threatened to overwhelm me.

18 *If you can force your heart and nerve and sinew*
To serve your turn long after they are gone . . .

The weeks of unemployment and hard knocks turned into months. I continued to find two or three days of work here and there. And I continued to be thrown out when I rebelled at the ill treatment, overwork and insults. I kept pounding the streets looking for a place where they would
19 treat me half decently, where my devotion to work and faith in Kipling's poem would be appreciated. I remember the worn-out shoes I bought in a secondhand store on Myrtle Avenue at the corner of Adams Street. The round holes in the soles that I tried to cover with pieces of carton were no match for the frigid knives of the unrelenting snow.

One night I returned late after a long day of looking for work. I was hungry. My room was dark and cold. I wanted to warm my numb body. I lit a match and began looking for some scraps of wood and a piece of paper to start a fire. I searched all over the floor. No wood, no paper. As I stood up, the glimmering flicker of the dying match was reflected in
20 the glass surface of the framed poem. I unhooked the poem from the wall. I reflected for a minute, a minute that felt like an eternity. I took the frame apart, placing the square glass upon the small table. I tore the gold paper on which the poem was printed, threw its pieces inside the stove and, placing the small bits of wood from the frame on top of the paper, I lit it, adding soft and hard coal as the fire began to gain strength and brightness.

21 I watched how the lines of the poem withered into ashes inside the small stove.

Session 2, Multiple-Choice Questions

20. The opening paragraph sets the tone of this essay as

✔ A. reflective.

B. optimistic.

C. antagonistic.

D. fearful.

Reporting Category/Learning Standard for Item 20: ***Literature*/Learning Standard 15 (p. 81)**

21. Which point of view is used in this essay?

✔ A. first person

B. second person

C. third-person omniscient

D. third-person objective

Reporting Category/Learning Standard for Item 21: ***Literature*/Learning Standard 12 (p. 81)**

22. In this sentence from paragraph 3, "I would be rewarded with an intimate warmth as little by little the pigmy stove became alive puffing out its sides, hot and red, like the crimson cheeks of a Santa Claus," a comparison is made between

A. intimate warmth and the hot pigmy stove.

B. a little stove and its hot, red sides.

C. a red-hot stove and Santa Claus's red outfit.

✔ D. the stove's red sides and Santa Claus's cheeks.

Reporting Category/Learning Standard for Item 22: ***Literature*/Learning Standard 15 (p. 81)**

23. Which is a synonym for *maxims* as it is used in paragraph 4?

A. autobiographies

✔ B. proverbs

C. novels

D. epitaphs

Reporting Category/Learning Standard for Item 23: ***Literature*/Learning Standard 8 (p. 81)**

24. The author implies that his lack of success in finding a decent job is influenced by

    A. a bad economy.

    B. competition from other workers.

✔ C. employers' prejudice.

    D. his lack of skills.

Reporting Category/Learning Standard for Item 24: ***Literature*/Learning Standard 12 (p. 81)**

25. What form of language is used in this essay?

    A. jargon

✔ B. standard English

    C. slang

    D. Middle English

Reporting Category/Learning Standard for Item 25: ***Language*/Learning Standard 6 (p. 80)**

26. In this memoir, the author mentions twice that he was seventeen in order to emphasize to the reader his

✔ A. relative innocence.

    B. solid work history.

    C. streetwise knowledge.

    D. impoverished past.

Reporting Category/Learning Standard for Item 26: ***Literature*/Learning Standard 12 (p. 81)**

27. The poem "If—" originally meant a great deal to the author because it gave him

    A. something to read on long, lonely nights.

    B. a way to become familiar with literature.

✔ C. hope and optimism to endure his harsh reality.

    D. pleasant memories of his school days.

Reporting Category/Learning Standard for Item 27: ***Literature*/Learning Standard 12 (p. 81)**

Session 2, Open-Response Question

28. Explain the author's attitude throughout this essay toward the poem "If—." Use specific evidence from the essay to support your answer.

Reporting Category/Learning Standard for Item 28: ***Literature*/Learning Standard 12 (p. 81)**

Session 3, Reading Passage #1

The following myths are somewhat similar in content, but originate from different cultures. "The Three Calabashes" is an African myth. "Pandora" (on the following page) is a Greek myth. Read the myths carefully and answer the questions that follow.

THE THREE CALABASHES

Shortly after Leza had created the first two human beings, Mu-longa and Mwi-nam-buz-hi, he summoned to his presence the honeybird May-imba, and gave it three calabashes*, all of them closed at both ends. He told May-imba to take these to the man and the woman, without opening them on
1 the way. May-imba was then to tell the human couple that they might open the two calabashes which contained seed. The third, however, was not to be opened until Leza himself had come to the earth and given instructions concerning its contents.

On the way, May-imba could not contain his curiosity, and opened the calabashes. The first two
2 contained seed of different kinds, and when May-imba had examined the contents he put them back and closed the calabashes.

He opened the third. In this calabash were death, sickness, all kinds of beasts of prey, and dangerous reptiles. These unpleasant things came out, and May-imba could not catch them.
3 Then Leza appeared and helped the bird to look for them. They did, it is true, find the lion in its lair, the snake in its hole and so forth, but they were unable to capture them.

Leza said to May-imba: "You have sinned greatly and the responsibility is yours." The terrified
4 bird flew into the woods and no longer lived among men.

Leza then said to Mu-longa and his wife: "May-imba is a great sinner. I told him that on no account was the third gourd to be opened until I came; but he disobeyed me. Thereby he has brought
5 you much trouble, sickness, death; and the risk from lions, leopards, snakes, and other evil animals and reptiles. This I cannot help now, for these things have escaped and cannot be caught; so you must build yourselves huts and shelters to live in for protection from them."

*calabash – a dried, hollowed shell of a gourd (e.g., squash, pumpkin) used as a container

PANDORA

While Prometheus, the courageous Titan, was enduring his punishment far to the north in Scythia,
1 Zeus who delighted in thunder, proceeded with his next objective, the punishment of man. Once again he called upon his son, Hephaestus, the smith.

"Hephaestus," he commanded, "I want you to create a beautiful woman from the same ingredi-
2 ents that Prometheus, the clever Titan, used to create his beloved mortals. I want her to be beautiful enough to be a blessing, yet evil enough to be a punishment for mankind."

Strong-armed Hephaestus obeyed his great father's order, giving the girl the face of a goddess but human voice and strength. Then grey-eyed Athena dressed her in silver clothing and placed an embroi-
3 dered veil upon her head. Hephaestus crowned her with a golden wreath of intertwined wild animals, a marvel which he, alone, could devise. When they had finished, the children of Zeus led the mortal girl out among the immortal gods.

The Olympians gasped in admiration at the beautiful creature the renowned smith had created.
4 The Graces placed golden necklaces around her neck, while the Seasons placed spring flowers among the golden animals of her crown.

Then the Lord of Olympus directed golden Aphrodite to give her the qualities of love and desire.
5 Finally, in order to insure that woman would be a source of sorrow to man, Olympian Zeus instructed his cunning son, Hermes, to give the girl an inquisitive and deceitful nature.

As far-seeing Zeus commanded, all obeyed. Swift-footed Hermes decided that this mortal girl
6 should be called Pandora because so many Olympians had given her gifts. Finally, as his gift, the Lord of High Thunder gave Pandora a sealed jar and told Hermes the Wayfinder to accompany her down to earth, where he should present her to gentle Epimetheus from the immortals.

Epimetheus could not resist such an appealing gift. Even though his brother Prometheus had
7 warned him never to accept any gift from Mount Olympus because it might prove to be a source of evil, gentle Epimetheus could not believe that anyone as beautiful as Pandora could bring anything but delight. Therefore, he immediately married her.

Soon, thereafter, Pandora became curious about what the sealed jar contained. No sooner had she broken the seal and lifted the lid from the great jar than its contents flew out into the air, scattering every-
8 where. Olympian Zeus had filled the jar to the brim with evils for man, thousands of sorrows and sicknesses that now hovered, some to attack by day, and others to steal in by night. Only one spirit remained behind in the jar. Hope had become caught under the rim, and it could not fly away before Pandora replaced the lid. Through the contents of the jar, the Lord of High Thunder completed his terrible revenge against Prometheus, thereby warning both gods and mortals not to challenge his authority.

Session 3, Multiple-Choice Questions

29. The most significant difference between the first two calabashes and the third calabash is that the third calabash

    A. was permanently broken upon opening.

✔ B. unleashed things harmful to human beings.

    C. contained lions, leopards, and snakes.

    D. drove the honeybird to the woods permanently.

Reporting Category/Learning Standard for Item 29: ***Literature*/Learning Standard 12 (p. 81)**

30. Which combination of the first two sentences in paragraph 3 of "The Three Calabashes" is punctuated correctly?

    A. He opened the third in this calabash were death, sickness, all kinds of beasts of prey, and dangerous reptiles.

    B. He opened the third, in this calabash were death, sickness, all kinds of beasts of prey, and dangerous reptiles.

✔ C. He opened the third; in this calabash were death, sickness, all kinds of beasts of prey, and dangerous reptiles.

    D. He opened the third in this calabash; were death, sickness; all kinds of beasts of prey, and dangerous reptiles.

Reporting Category/Learning Standard for Item 30: ***Language*/Learning Standard 5 (p. 80)**

31. Who suffers the most from May-imba's deed?

    A. May-imba

    B. Leza

    C. other honeybirds

✔ D. human beings

Reporting Category/Learning Standard for Item 31: ***Literature*/Learning Standard 12 (p. 81)**

32. What is the most likely reason Leza gave May-imba instructions not to open the calabashes before they were delivered to the human beings?

A. The contents were none of May-imba's business.

B. Only the human beings were authorized to open them.

✔ C. This task was a test of faith Leza devised for May-imba.

D. Leza wanted to keep all of the seed for the human beings.

Reporting Category/Learning Standard for Item 32: ***Literature*/Learning Standard 16 (p. 82)**

33. The Greek myth "Pandora" provides an explanation for

A. the competition between Zeus and Epimetheus.

B. Zeus's relationship with his son, Hephaestus.

C. how Prometheus challenged Zeus's authority.

✔ D. the sorrows and sicknesses that afflict people.

Reporting Category/Learning Standard for Item 33: ***Literature*/Learning Standard 16 (p. 82)**

34. According to the myth "Pandora," who created human beings?

✔ A. Prometheus

B. Zeus

C. Hephaestus

D. Epimetheus

Reporting Category/Learning Standard for Item 34: ***Literature*/Learning Standard 9 (p. 81)**

35. Why did Zeus order the creation of Pandora?

A. He wanted to please the world with her beauty.

✔ B. It was an act of revenge against Prometheus.

C. Epimetheus had asked him to provide a wife.

D. Pandora was needed to complete the Olympian group.

Reporting Category/Learning Standard for Item 35: ***Literature*/Learning Standard 12 (p. 81)**

36. What is the **best** meaning for *hovered* as used in paragraph 8 of "Pandora"?

✔ A. lingered

B. threatened

C. wavered

D. challenged

Reporting Category/Learning Standard for Item 36: ***Literature*/Learning Standard 8 (p. 81)**

Session 3, Open-Response Question

37. Explain the similarities and differences between "The Three Calabashes" and "Pandora." Use specific evidence from both myths to support your answer.

*Reporting Category/*Learning Standard for Item 37: ***Literature/*Learning Standard 16 (p. 82)**

Session 3, Reading Passage #2

The following selection is a short story by Langston Hughes. As you read the story, note the relationship between the two characters. When you have finished reading, answer the questions that follow.

EARLY AUTUMN

by Langston Hughes (1902-1967)

When Bill was very young, they had been in love. Many nights they had spent walking, talking together. Then something not very important had come between them, and they didn't speak. Impulsively, she had married a man she thought she loved. Bill went away, bitter about women.

Yesterday, walking across Washington Square, she saw him for the first time in years.

"Bill Walker," she said.

He stopped. At first he did not recognize her, to him she looked so old.

"Mary! Where did you come from?"

Unconsciously, she lifted her face as though wanting a kiss, but he held out his hand. She took it.

"I live in New York now," she said.

"Oh" — smiling politely. Then a little frown came quickly between his eyes.

"Always wondered what happened to you, Bill."

"I'm a lawyer. Nice firm, way downtown."

"Married yet?"

"Sure. Two kids."

"Oh," she said.

A great many people went past them through the park. People they didn't know. It was late afternoon. Nearly sunset. Cold.

"And your husband?" he asked her.

"We have three children. I work in the bursar's office at Columbia."

"You're looking very . . ." (he wanted to say *old*) ". . . well," he said.

She understood. Under the trees in Washington Square, she found herself desperately reaching back into the past. She had been older than he then in Ohio. Now she was not young at all. Bill was still young.

"We live on Central Park West," she said. "Come and see us sometime."

"Sure," he replied. "You and your husband must have dinner with my family some night. Any night. Lucille and I'd love to have you."

The leaves fell slowly from the trees in the Square. Fell without wind. Autumn dusk. She felt a little sick.

"We'd love it," she answered.

"You ought to see my kids." He grinned.

Suddenly the lights came on up the whole length of Fifth Avenue, chains of misty brilliance in the blue air.

"There's my bus," she said.

He held out his hand. "Good-bye."

"When . . ." she wanted to say, but the bus was ready to pull off. The lights on the avenue blurred, twinkled, blurred. And she was afraid to open her mouth as she entered the bus. Afraid it would be impossible to utter a word.

Suddenly she shrieked very loudly. "Good-bye!" But the bus door had closed.

The bus started. People came between them outside, people crossing the street, people they didn't know. Space and people. She lost sight of Bill. Then she remembered she had forgotten to give him her address — or to ask him for his — or tell him that her youngest boy was named Bill too.

Session 3, Multiple-Choice Questions

38. This story is told mostly through

    A. flashbacks.

    B. foreshadowing.

✔ C. dialogue.

    D. description.

Reporting Category/Learning Standard for Item 38: ***Literature*/Learning Standard 12 (p. 81)**

39. What significance does the sentence "Then a little frown came quickly between his eyes" have to the development of this story?

    A. It contributes to the physical description of Bill.

    B. It establishes that Bill is concerned for Mary's safety because she lives in the city.

    C. It emphasizes the coldness of the weather.

✔ D. It hints that Bill is uneasy that Mary lives in the same city where he lives.

Reporting Category/Learning Standard for Item 39: ***Literature*/Learning Standard 12 (p. 81)**

40. The tone of the story is revealed by the characters' conversation, which is

    A. humorous.

✔ B. strained.

    C. angry.

    D. relaxed.

Reporting Category/Learning Standard for Item 40: ***Literature*/Learning Standard 15 (p. 81)**

41. From what point of view is this story told?

    A. first person, directly involved in the story

    B. first person, a witness to the story

    C. second person, directly involved in the story

✔ D. third person, all knowing

Reporting Category/Learning Standard for Item 41: ***Literature*/Learning Standard 12 (p. 81)**

V. Mathematics,

Grade 4

Mathematics, Grade 4

The spring 2000 MCAS Mathematics test was based on the learning standards of the Massachusetts *Mathematics Curriculum Framework* (1996). The *Framework* identifies four major content strands:

- Number Sense
- Patterns, Relations, and Functions
- Geometry and Measurement
- Statistics and Probability

At grade 4, the *Framework* divides each of the first three strands into multiple substrands. These substrands are specifically referenced in the MCAS document, *Guide to Interpreting the 2000 MCAS Reports for Schools and Districts,* due for release later in 2000.

Curriculum Framework *Learning Standards*

Learning standards are grouped below by substrand and are directly quoted from the *Framework;* applicable *Framework* page numbers are shown in parentheses.

Number Sense

Number Sense and Numeration (*Framework,* p. 34)

Students engage in problem solving, communicating, reasoning, and connecting to

- construct number meaning by using manipulatives and other physical materials to represent concepts of numbers in the real world.
- demonstrate an understanding of our numeration system by relating counting, grouping, and place value concepts.
- interpret the multiple uses of numbers by taking real-world situations and translating them into numerical statements.

Concepts of Whole Number Operations (*Framework*, p. 35)

Students engage in problem solving, communicating, reasoning, and connecting to

- model and discuss a variety of problem situations to help students move from the concrete to the abstract.
- relate the mathematical language and symbolism of operations to problem situations.
- identify a variety of problem structures that can be represented by a single operation.
- know when to use the operations of addition, subtraction, multiplication, and division; and describe their relationships.

Fractions and Decimals (*Framework*, p. 36)

Students engage in problem solving, communicating, reasoning, and connecting to

- demonstrate an understanding of the basic concepts of fractions, mixed numbers, and decimals.
- use models to relate fractions to decimals, find equivalent fractions, and explore operations on fractions and decimals.
- apply fractions and decimals to problem situations.

Estimation (*Framework*, p. 37)

Students engage in problem solving, communicating, reasoning, and connecting to

- describe the strategies used in exploring estimation.
- determine when an estimate is appropriate.
- apply estimation when working with quantities, measurement, and computation.
- use estimation to check solutions to determine if the results of computational problems make sense.

Whole Number Computation (*Framework*, p. 38)

Students engage in problem solving, communicating, reasoning, and connecting to

- model, explain, and develop proficiency with basic facts and algorithms.
- use calculators in appropriate computational situations.

Patterns, Relations, and Functions

Patterns and Relationships (*Framework*, p. 57)

Students engage in problem solving, communicating, reasoning, and connecting to

- identify, describe, extend, and create a wide variety of patterns.
- represent and describe mathematical relationships.
- explore the use of variables and open sentences to express relationships.
- use patterns and relationships to analyze mathematical situations.

Algebra/Mathematical Structures (*Framework*, pp. 58-59)

Students engage in problem solving, communicating, reasoning, and connecting to

- discover how to form, then write, number sentences for real problems.
- investigate and describe ways to find missing components in number sentences.
- demonstrate through hands-on activities, an understanding of maintaining balances in number sentences.
- explain the use of variables in number sentences.
- explore and demonstrate an understanding of commutative properties for addition and multiplication.

Geometry and Measurement

Geometry and Spatial Sense (*Framework*, p. 72)

Students engage in problem solving, communicating, reasoning, and connecting to

- describe, model, draw, and classify shapes.
- investigate and predict the results of combining, subdividing, and changing shapes.
- develop spatial sense.
- use geometric ideas to develop numerical ideas.
- recognize and appreciate geometry in the world.

Measurement (*Framework*, p. 73)

Students engage in problem solving, communicating, reasoning, and connecting to

- demonstrate the attributes of length, capacity, weight, area, volume, time, temperature, and angle.
- use the process of measuring and the concepts related to units of measurement.
- make and use estimates of measurement.
- measure in everyday problem situations.

Statistics and Probability

Statistics and Probability (*Framework*, p. 88)

Students engage in problem solving, communicating, reasoning, and connecting to

- collect, organize, and describe data.
- construct, read, and interpret displays of data.
- formulate and solve problems that involve collecting and analyzing data.
- explore and describe the concepts of chance.

MCAS Reporting Categories

In *Test Item Analysis Reports* and on the *Subject Area Subscore* pages of the MCAS *School* and *District Reports*, Mathematics test results are reported under the following four MCAS reporting categories, which are identical to the four *Mathematics Curriculum Framework* content strands:[7]

- Number Sense
- Patterns, Relations, and Functions
- Geometry and Measurement
- Statistics and Probability

[7] Please note that these MCAS reporting categories differ from those listed in the 1998 publication, *Guide to the Massachusetts Comprehensive Assessment System: Mathematics*. The reporting categories listed in that publication are referenced as **substrands** in this document.

MCAS Spring 2000 Common Test Items
Mathematics, Grade 4

Test Sessions

MCAS grade 4 Mathematics Student Test Booklets contained 2 separate test sessions. Each session included multiple-choice, short-answer, and open-response questions.

Mathematics Tool Kits

During testing, each grade 4 student was provided with a **Mathematics Tool Kit.** A sample of that Tool Kit is included in Appendix A of this document. No calculators or other reference tools or materials were allowed during grade 4 Mathematics testing sessions.

Cross-Reference Information

The shaded bar underneath each item indicates the item's MCAS reporting category and the *Framework* substrand that contains the learning standards assessed by the item. The parentheses indicate the page in this document where the learning standards may be found.

Since the *Framework* does not divide the *Statistics and Probability* strand into substrands at grade 4, items listing the reporting category of *Statistics and Probability* indicate "NA" ("Not Applicable") as the related substrand in their shaded bars.

Session 1, Multiple-Choice Questions

1. Graciela has ten marbles in her pocket.

   - Three marbles are blue.
   - Three marbles are red.
   - Four marbles are green.

   She reaches into her pocket and pulls out a marble. What is the chance she will pull a RED marble from her pocket?

   A. 1 out of 10

   B. 2 out of 10

   ✔ C. 3 out of 10

   D. 4 out of 10

Reporting Category/Substrand for Item 1: ***Statistics and Probability/NA*** **(p. 114)**

2. Cedar Grove Elementary School had a jump rope contest. Wilson jumped 293 times. Cathy jumped 412 times. What is the BEST ESTIMATE of how many more times Cathy jumped than Wilson?

   A. 250

   ✔ B. 100

   C. 200

   D. 50

Reporting Category/Substrand for Item 2: ***Number Sense/Estimation*** **(p. 112)**

3. Casey's family visited the Franklin Park Zoo. The giraffe was the tallest animal they saw. It was 18 feet tall. Casey is $4\frac{1}{2}$ feet tall. How many times taller was the giraffe than Casey?

   A. 3

✔ B. 4

   C. 5

   D. 6

Reporting Category/Substrand for Item 3: ***Number Sense*/Fractions and Decimals (p. 112)**

4. The 28 students in Mr. West's class have pen pals in other countries. Each student will write seven letters to a pen pal. How many letters will Mr. West's students write?

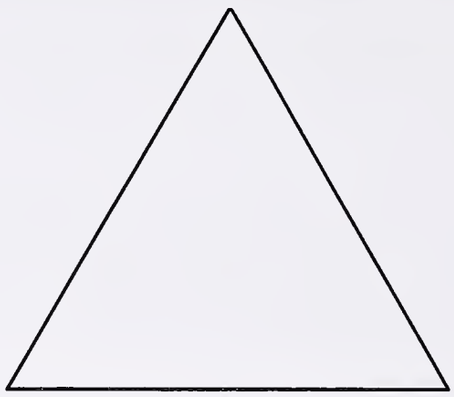
   A. 140 letters

   B. 36 letters

   C. 35 letters

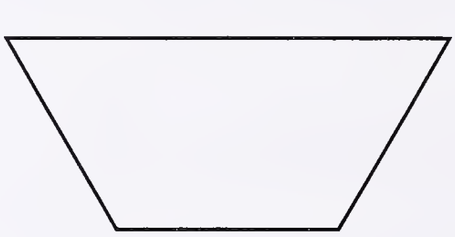
✔ D. 196 letters

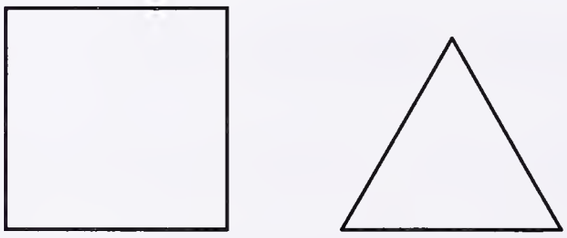
Reporting Category/Substrand for Item 4: ***Number Sense*/Whole Number Computation (p. 112)**

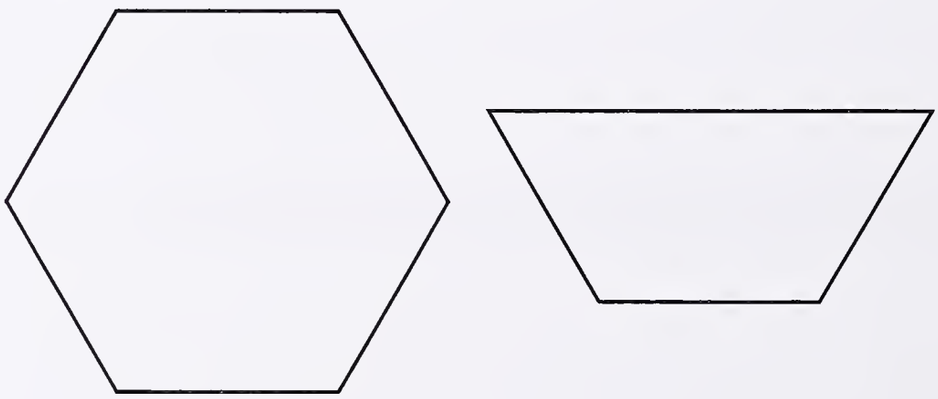


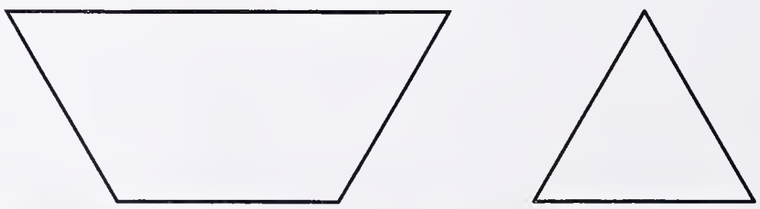
Use the triangle on the right and the shapes in your tool kit to answer question 5.

5. Which two SHAPES below can you put together to make the larger shape shown on the right?

A. 

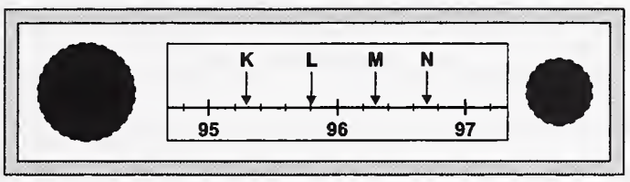
B. 

C. 

✔ D. 

Reporting Category/Substrand for Item 5: ***Geometry and Measurement*/Geometry and Spatial Sense (p. 113)**

6. Emily's favorite radio station is WXYZ at 96.3 on the radio dial. Which arrow on the radio dial below is closest to 96.3?



A. K

B. L

✔ C. M

D. N

Reporting Category/Substrand for Item 6: ***Number Sense*/Fractions and Decimals (p. 112)**

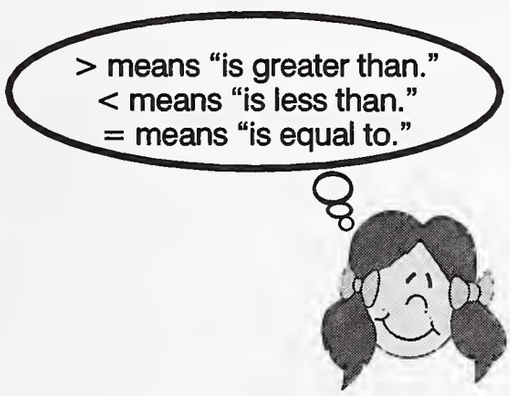
7. Which of the following is correct?

✔ A. $72 \div 8 > 6$
$18 - 9 > 3$

B. $72 \div 8 < 6$
$18 - 9 < 3$

C. $72 \div 8 = 6$
$18 - 9 = 3$

D. None of them is correct.

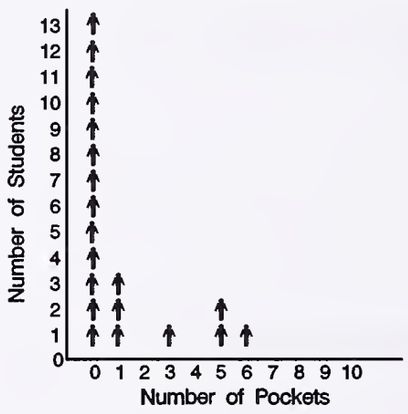


Reporting Category/Substrand for Item 7: ***Patterns, Relations, and Functions*/Patterns and Relationships (p. 113)**

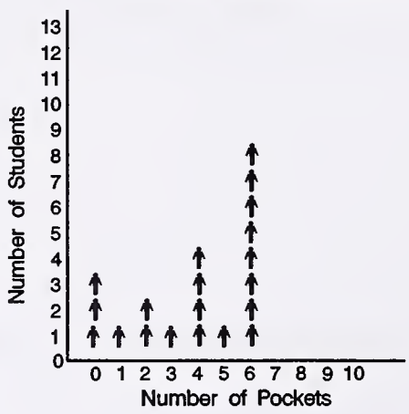
8. There are 20 students in Ms. Hall's class. On Tuesday they took a survey of how many pockets were in the clothes they were wearing. They found that more students had six pockets than any other number of pockets.

   Which graph below MOST LIKELY represents Ms. Hall's class on Tuesday?

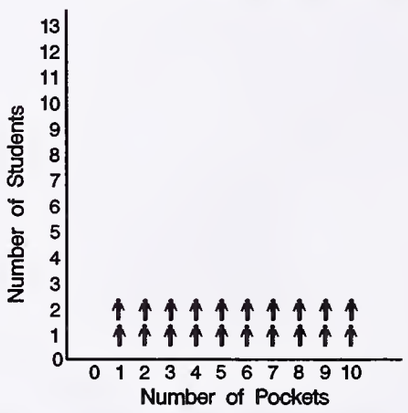
A.



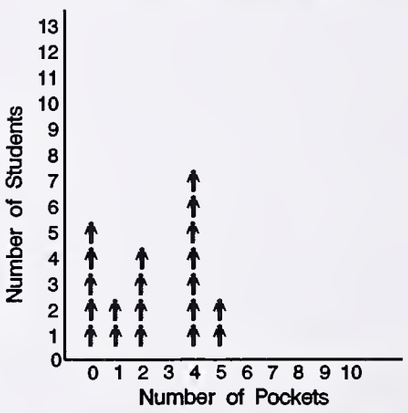
✔ B.



C.



D.



Reporting Category/Substrand for Item 8: ***Statistics and Probability/NA*** **(p. 114)**

Use the schedule below to answer question 9.

Saturday Morning Practice Schedule

	8:30	9:00	9:30	10:00	10:30	11:00	11:30	12:00
Elementary School Field	Green Team				Yellow Team			
Middle School Field			Purple Team			Orange Team		
High School Field		Red Team					Blue Team	

9. Several soccer teams practice on the three school fields listed above. The schedule shows the times different teams practice each Saturday. Which field is used for the MOST hours on Saturday morning?

   A. Elementary School Field

   B. Middle School Field

✔ C. High School Field

   D. All fields are used for the same amount of time.

Reporting Category/Substrand for Item 9: ***Statistics and Probability*/NA (p. 114)**

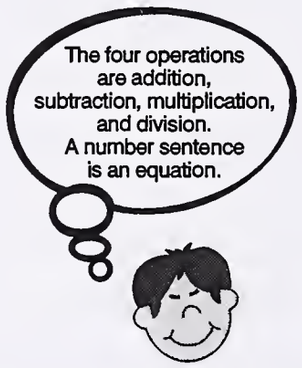
Session 1, Open-Response Question

10. Write FOUR different number sentences that follow these rules.

    - Each number sentence must show a DIFFERENT way of getting the number 42.
    - Each number sentence must contain AT LEAST TWO DIFFERENT OPERATIONS.
    - Use each of the four operations at least once.

    An example is shown below. You may not use this example as one of your four number sentences.

    Example: $(8 \div 4) + 40 = 42$



Reporting Category/Substrand for Item 10: ***Number Sense*/Concepts of Whole Number Operations (p. 112)**

Session 1, Short-Answer Questions

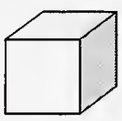
11. Compute:

$$\begin{array}{r} 536 \\ \times 25 \\ \hline \end{array}$$

Correct Answer: 13,400

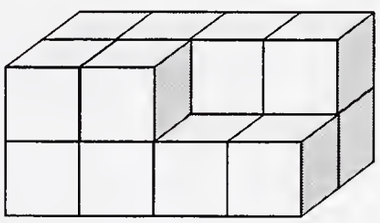
Reporting Category/Substrand for Item 11: Number Sense/**Whole Number Computation (p. 112)**

12. The volume of this cube is 1 cubic centimeter.



= 1 cubic cm

What is the volume of this figure?

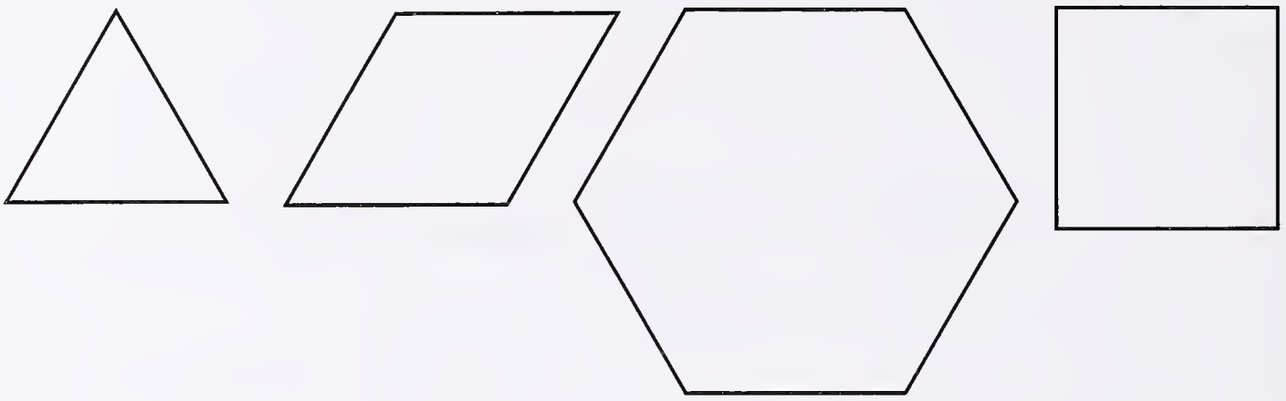


Correct Answer:
14 cubic centimeters

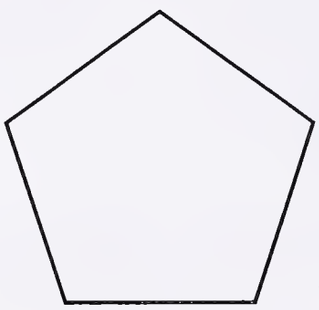
Reporting Category/Substrand for Item 12: ***Geometry and Measurement***/Measurement (p. 114)

Session 1, Open-Response Question

Use the shapes below to answer question 13.



13. Choose three different shapes from the set above. You will use mathematical language to list FOUR things that describe each shape. You may use the shapes in your tool kit to help you.

Example: If this shape  were in the set you chose, two of the things you could write about this shape are:

- It has 5 sides.
- All sides are equal.

a. Name one of the shapes you chose. Make a list of FOUR different things that describe this shape.

b. Name another one of the shapes you chose. Make a list of FOUR different things that describe this shape.

c. Name the last shape you chose. Make a list of FOUR different things that describe this shape.

Reporting Category/Substrand for Item 13. ***Geometry and Measurement*/Geometry and Spatial Sense (p. 113)**

Session 1, Multiple-Choice Questions

Use the pictograph on the right to answer question 14.

Cellular Phone Sales	
Name of Company	**Number of Cellular Phones Sold**
Mobile Phones	3
Beep Beep Phones	2
On the Go Phones	7
Quick Call Phones	?

= 2,000 cellular phones

14. Marvin is making a graph to show the number of phones each cellular phone company sold last year. Quick Call Phones sold 13,000 phones. How many telephone symbols are needed to show Quick Call Phones's sales?

A. $5\frac{1}{2}$

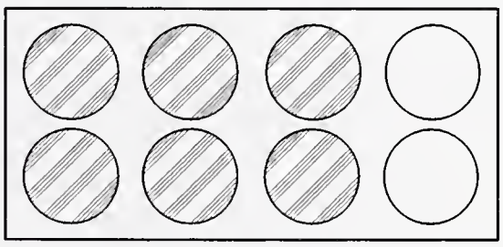
✔ B. $6\frac{1}{2}$

C. 7

D. 13

Reporting Category/Substrand for Item 14: ***Statistics and Probability*/NA (p. 114)**

Use the figure on the right to answer question 15.



15. Which fraction shows the part of the set of balls that has stripes?

A. $\frac{1}{4}$

B. $\frac{2}{3}$

✔ C. $\frac{3}{4}$

D. $\frac{3}{2}$

Reporting Category/Substrand for Item 15: ***Number Sense*/Fractions and Decimals (p. 112)**

16. When we multiply 37 by multiples of 3, we see a pattern. If the pattern continues this way, then 37 × 21 =

$37 \times 3 = 111$
$37 \times 6 = 222$
$37 \times 9 = 333$
$37 \times 12 = 444$

✔ A. 777.

B. 555.

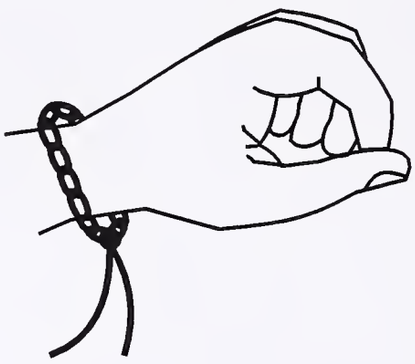
C. 888.

D. 666.

Reporting Category/Substrand for Item 16: ***Patterns, Relations, and Functions*/Patterns and Relationships (p. 113)**

Session 1, Open-Response Question

You may use the inch ruler from your tool kit to answer question 17.



17. Lucas is making friendship bracelets.

    It takes him 3 minutes to make $1\frac{1}{2}$ inches of a bracelet.

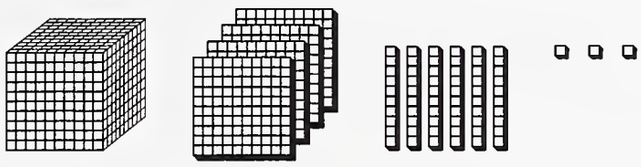
a. If he works at the same speed, how many minutes will it take him to make 3 inches of a bracelet? Use pictures, numbers, or words to show or explain how you found your answer.

b. A complete bracelet is 9 inches long. If Lucas works at the same speed, how many minutes will it take him to make a 9-inch bracelet? Use pictures, numbers, or words to show or explain how you know.

Reporting Category/Substrand for Item 17: ***Geometry and Measurement*/Measurement (p. 114)**

Session 2, Multiple-Choice Questions

Use the picture below to answer question 18.



18. If you add 3 more hundreds to the picture above, what number would be shown?

    A. 4,463

    B. 1,493

✔ C. 1,763

    D. 1,466

Reporting Category/Substrand for Item 18: ***Number Sense*/Number Sense and Numeration (p. 111)**

19. For the spring concert, chorus members may wear blue, white, or black pants and black, red, or white T-shirts. How many different outfits can be made?

    A. 3

    B. 8

    C. 6

✔ D. 9

Reporting Category/Substrand for Item 19: ***Statistics and Probability*/NA (p. 114)**

20. Three friends plan to equally share the cost of a video game that costs $38.89 including tax. Which is the BEST ESTIMATE of the amount each friend will have to pay?

    A. $10

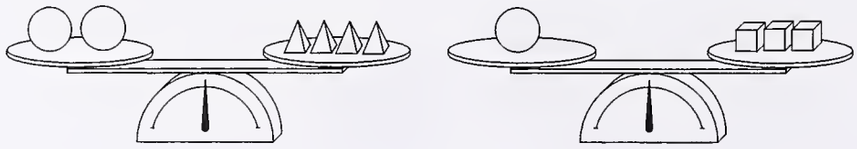
    B. $16

✔ C. $13

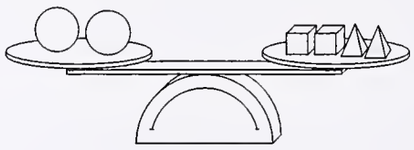
    D. $8

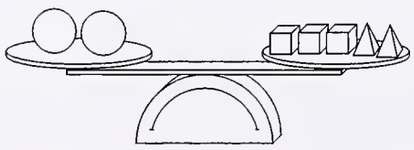
Reporting Category/Substrand for Item 20: ***Number Sense*/Estimation (p. 112)**

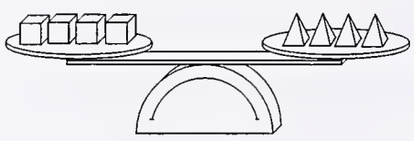
Use the picture below to answer question 21.

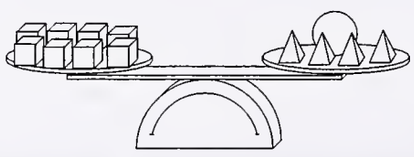


21. If the scales shown above are balanced, then which scale below is also balanced?

A. 

✔ B. 

C. 

D. 

Reporting Category/Substrand for Item 21: ***Patterns, Relations, and Functions*/Algebra/Mathematical Structures (p. 113)**

Use the figure on the right to answer question 22.

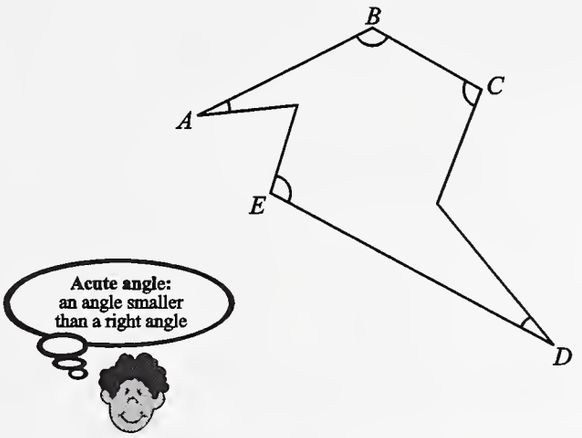
22. Which angles in the figure are ACUTE angles?

A. $\angle A$ and $\angle B$

B. $\angle B$ and $\angle E$

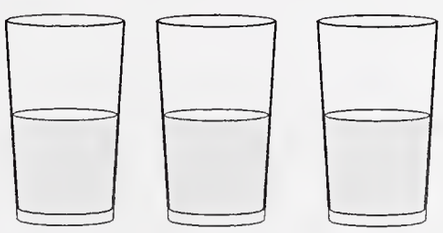
C. $\angle C$ and $\angle E$

✔ D. $\angle A$ and $\angle D$



*Reporting Category/*Substrand for Item 22: ***Geometry and Measurement/*Geometry and Spatial Sense (p. 113)**

Use the picture below to answer question 23.



23. Which number sentence tells how much milk is in all the glasses?

✔ A. $\frac{1}{2} + \frac{1}{2} + \frac{1}{2} = \square$

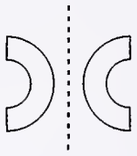
B. $\frac{1}{2} \times 6 = \square$

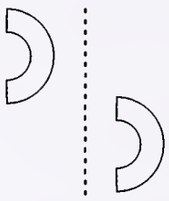
C. $\frac{1}{2} + 3 = \square$

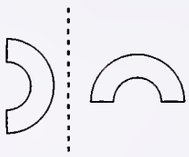
D. $3 \times 2 = \square$

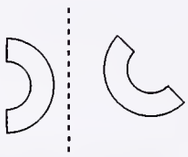
*Reporting Category/*Substrand for Item 23: ***Number Sense/*Number Sense and Numeration (p. 111)**

24. Which shows a SLIDE of ?

A. 

✔ B. 

C. 

D. 

Reporting Category/Substrand for Item 24: ***Geometry and Measurement*/Geometry and Spatial Sense (p. 113)**

25. Brittany and Stacy have a bag of 104 candies. They want to find the greatest number of candies to put into 13 party favors so that each favor will have the same amount.

- Brittany says they should see how many times they can subtract 13 from 104.
- Stacy says they should divide 104 by 13.

Who is correct?

A. only Brittany

B. only Stacy

C. Both are wrong.

✔ D. Both are correct.

Reporting Category/Substrand for Item 25: ***Number Sense*/Concepts of Whole Number Operations (p. 112)**

Use the information in the box to answer question 26.

26. How many children took part in the survey?

A. 56

B. 12

✔ C. 34

D. 32

Kids Magazine took a survey of favorite Olympic winter sports. Each child who took part voted for TWO sports. These were the results.

FAVORITE OLYMPIC WINTER SPORTS

Skating	𝍸 𝍸 𝍸 𝍸 𝍸 |
Hockey	𝍸 𝍸 |
Skiing	𝍸 |||
Snowboarding	𝍸 𝍸 𝍸 𝍸 |||

Reporting Category/Substrand for Item 26: ***Statistics and Probability/NA*** **(p. 114)**

Session 2, Open-Response Question

Use the chart below to answer question 27.

Hundreds Chart

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

27. Lajeda made a hundreds chart on a piece of paper so that the entire page was covered. Then she shut her eyes and put her finger on the chart.

    a. Is it more likely that she put her finger on a one-digit number or a two-digit number? Explain how you know.

    b. Is it more likely she put her finger on an even number or an odd number? Explain how you know.

Reporting Category/Substrand for Item 27: ***Statistics and Probability*/NA (p. 114)**

Session 2, Short-Answer Questions

28. Compute:

$$264 + 812 + 53 + 506 = ?$$

Correct Answer: 1,635

Reporting Category/Substrand for Item 28: ***Number Sense*/Whole Number Computation (p. 112)**

29. Compute:

$$4\overline{)428}$$

Correct Answer: 107

Reporting Category/Substrand for Item 29: ***Number Sense*/Whole Number Computation (p. 112)**

Use the picture of marbles below to answer question 30.

30. TOGETHER Charlotte and Vinny have 20 marbles. Charlotte has 4 times as many marbles as Vinny. How many marbles does Charlotte have?

Correct Answer: 16

Reporting Category/Substrand for Item 30: ***Patterns, Relations, and Functions*/Patterns and Relationships (p. 113)**

Session 2, Open-Response Question

31. It costs 20¢ to mail a postcard and 33¢ to mail a letter.

Stamps

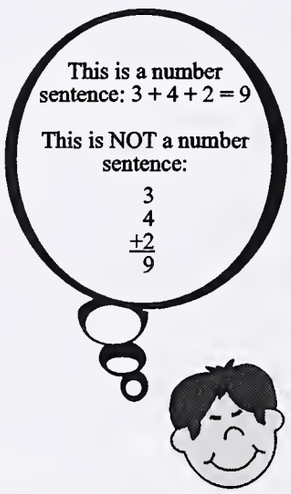
postcard	20¢
letter	33¢

a. Anna decided to send 5 postcards to her relatives and some letters to her friends. She spent $4.30 on stamps to mail the postcards and letters. How many letters did she send to friends? Use pictures, numbers, or words to show or explain your answer.

b. Ralph sent mail to his friends.

- He sent Lydia one letter and one postcard.
- He sent Jerry two postcards.
- He sent Monique three letters.

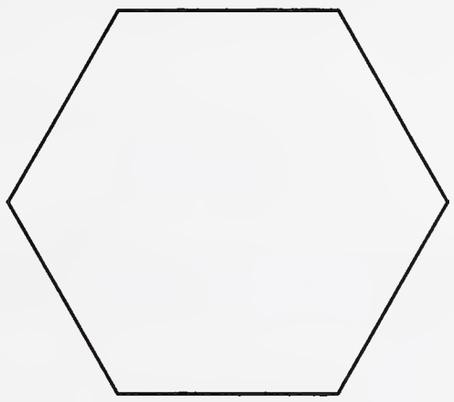
Write a number sentence to show how much money Ralph spent for stamps. Be sure to include the answer in your number sentence.



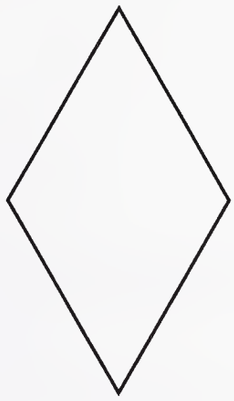
Reporting Category/Substrand for Item 31: ***Patterns, Relations, and Functions*/Patterns and Relationships (p. 113)**

Session 2, Multiple-Choice Questions

Use the figures below and the shapes in your tool kit to answer question 32.



hexagon



rhombus

32. If the hexagon equals one whole, what fractional part of the hexagon is one rhombus?

✔ A. $\frac{1}{3}$

B. $\frac{1}{2}$

C. $\frac{1}{6}$

D. $\frac{1}{4}$

Reporting Category/Substrand for Item 32: ***Number Sense*/Fractions and Decimals (p. 112)**

33. What is the next number in the pattern below?

0, 1, 3, 6, 10, ____

A. 20

✔ B. 15

C. 14

D. 26

Reporting Category/Substrand for Item 33: ***Patterns, Relations, and Functions*/Patterns and Relationships (p. 113)**

34. Jorge has three coins in his pocket. Which amount could his coins NOT be worth?

A. 16¢

B. 55¢

✔ C. 46¢

D. 25¢

Reporting Category/Substrand for Item 34: ***Patterns, Relations, and Functions*/Patterns and Relationships (p. 113)**

35. Bridgett's mother recorded Bridgett's height on each birthday. Which is the BEST way for Bridgett to show this information?

✔ A. line graph

B. tally chart

C. Venn diagram

D. circle graph

Reporting Category/Substrand for Item 35: ***Statistics and Probability*/NA (p. 114)**

Use the example of the magic square on the right to help you answer question 36.

36. In a magic square, the sum of the numbers in each row, column, and diagonal is the same. Which TWO numbers complete the magic square below?

A. 9 and 4

✔ B. 9 and 3

C. 10 and 2

D. 10 and 3

Example of a Magic Square

4	9	2	→ 15
3	5	7	
8	1	6	
↓ 15			↘ 15

Magic Square

?	1	11
9	7	5
?	13	5

Reporting Category/Substrand for Item 36: ***Number Sense*/Whole Number Computation (p. 112)**

37. Using estimation, decide which sticker below has the GREATEST perimeter. (Remember: Perimeter is the distance around a figure.)

A.

✔ B.

C.

D.

Reporting Category/Substrand for Item 37: ***Geometry and Measurement*/Measurement (p. 114)**

Use the information in the line graph to answer question 38.

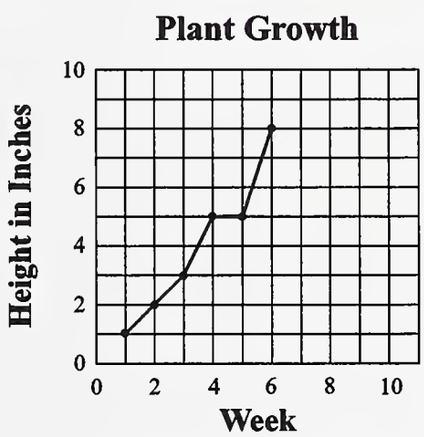
38. Between which two weeks did the plant show the GREATEST increase in height?

A. Weeks 1 and 2

B. Weeks 3 and 4

C. Weeks 4 and 5

✔ D. Weeks 5 and 6



Reporting Category/Substrand for Item 38: ***Statistics and Probability*/NA (p. 114)**

39. Which number belongs in the box to make the number sentence below true?

$$(15 - 3) \times (2 + 3) = \square \times 5$$

A. 5

B. 15

✔ C. 12

D. 30

Reporting Category/Substrand for Item 39: ***Patterns, Relations, and Functions*/Algebra/Mathematical Structures (p. 113)**

VI. Mathematics,

Grade 8

Mathematics, Grade 8

The spring 2000 MCAS Mathematics test was based on the learning standards of the Massachusetts *Mathematics Curriculum Framework* (1996). The *Framework* identifies four major content strands:

- Number Sense
- Patterns, Relations, and Functions
- Geometry and Measurement
- Statistics and Probability

At grade 8, the *Framework* divides each strand into multiple substrands. These substrands are specifically referenced in the MCAS document, *Guide to Interpreting the 2000 MCAS Reports for Schools and Districts,* due for release later in 2000.

Curriculum Framework *Learning Standards*

Learning standards are grouped below by substrand and are directly quoted from the *Framework;* applicable *Framework* page numbers are shown in parentheses.

Number Sense

Number and Number Relationships (*Framework,* p. 40)

Students engage in problem solving, communicating, reasoning, and connecting to

- represent and use equivalent forms of numbers, including integers, fractions, decimals, percents, exponents, and scientific notation.
- apply ratios, proportions, and percents.
- investigate and describe the relationships among fractions, decimals, and percents.
- represent numerical relationships in one- and two-dimensional graphs.

Number Systems and Number Theory (*Framework*, p. 41)

Students engage in problem solving, communicating, reasoning, and connecting to

- explain the need for numbers other than whole numbers.
- know and use order relations for whole numbers, fractions, decimals, integers, and rational numbers.
- use operations involving fractions, decimals, integers, and rational numbers.
- demonstrate how basic operations are related to one another.
- create and apply number theory concepts, including prime numbers, factors, and multiples.

Computation and Estimation (*Framework*, p. 42)[8]

Students engage in problem solving, communicating, reasoning, and connecting to

- compute with whole numbers, fractions, decimals, integers, and rational numbers.
- develop, analyze, and explain procedures for computing, estimating, and solving proportions.
- select and use an appropriate method for computing from among mental arithmetic, paper-and-pencil, calculator, and computer methods.
- use computation, estimation, and proportions to solve problems.
- estimate to check the reasonableness of results of computations and problems involving rational numbers.

Ratio, Proportion, Percent (*Framework*, p. 42)[9]

Students engage in problem solving, communicating, reasoning, and connecting to

- compute with whole numbers, fractions, decimals, integers, and rational numbers.
- develop, analyze, and explain procedures for computing, estimating, and solving proportions.
- select and use an appropriate method for computing from among mental arithmetic, paper-and-pencil, calculator, and computer methods.
- use computation, estimation, and proportions to solve problems.
- estimate to check the reasonableness of results of computations and problems involving rational numbers.

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[8] The two MCAS subcategories, *Computation and Estimation* and *Ratio, Proportion, Percent,* mentioned on pages 67 and 71 of the MCAS document, *Guide to the Massachusetts Comprehensive Assessment System: Mathematics,* are recombined in 2000 to be reported as *Computation and Estimation.*

[9] See note 8.

Patterns, Relations, and Functions

Patterns and Functions (*Framework*, p. 60)

Students engage in problem solving, communicating, reasoning, and connecting to

- describe, extend, analyze, and create a wide variety of patterns.
- describe and represent relationships with models, tables, graphs, and rules, using sentences and algebraic expressions.
- analyze functional relationships to explain how a change in one quantity results in a change in another.
- use patterns and functions to represent and solve problems.

Algebra (*Framework*, p. 61)

Students engage in problem solving, communicating, reasoning, and connecting to

- understand and apply the concepts of variable, expression, and equation.
- represent situations and number patterns with tables, graphs, verbal rules, and equations and explore the interrelationships of these representations.
- analyze tables and graphs to identify properties and relationships.
- demonstrate an ability to solve linear equations, using concrete, informal, and formal methods.
- describe the strategies used to explore inequalities and nonlinear equations.
- apply algebraic methods to solve a variety of real-world and theoretical problems.
- construct expressions or equations that model problems.
- explore and describe a variety of ways to solve equations, including hands-on activities, trial and error, and numerical analysis.
- know and apply algebraic procedures for solving equations and inequalities.

Geometry and Measurement

Geometry (*Framework*, p. 75)

Students engage in problem solving, communicating, reasoning, and connecting to

- identify, describe, compare, and classify geometric figures.
- explore and describe the properties of points, lines, and planes.
- visualize and draw geometric figures.
- explore and describe transformations of geometric figures.
- represent and solve problems, using geometric models.
- apply geometric properties and relationships.
- develop and explain the concept of π.
- develop and explain the concept of the Pythagorean theorem.

Measurement (*Framework*, p. 76)[10]

Students engage in problem solving, communicating, reasoning, and connecting to

- select appropriate units and tools to measure to the degree of accuracy required in a particular situation.
- describe the meaning of perimeter, area, volume, angle measure, capacity, density, weight, and mass.
- develop and describe the concepts of rates and other derived and indirect measurements.
- develop and apply formulas and procedures for determining measures to solve problems.

[10] The two MCAS subcategories, *Measurement* and *Geometric Measurement*, mentioned on pages 86 and 90 of the MCAS document, *Guide to the Massachusetts Comprehensive Assessment System: Mathematics*, have been recombined in 2000 to be reported as *Measurement*.

Geometric Measurement (*Framework*, p. 76)[11]

Students engage in problem solving, communicating, reasoning, and connecting to

- select appropriate units and tools to measure to the degree of accuracy required in a particular situation.
- describe the meaning of perimeter, area, volume, angle measure, capacity, density, weight, and mass.
- develop and describe the concepts of rates and other derived and indirect measurements.
- develop and apply formulas and procedures for determining measures to solve problems.

Statistics and Probability

Statistics (*Framework*, p. 90)

Students engage in problem solving, communicating, reasoning, and connecting to

- collect, organize, and describe data systematically.
- construct, read, and interpret tables, charts, and graphs.
- make inferences and convincing arguments that are based on data analysis.
- evaluate arguments that are based on data analysis.
- develop and explain why statistical methods are powerful aids for decision making.

Probability (*Framework*, p. 91)

Students engage in problem solving, communicating, reasoning, and connecting to

- model situations by devising and carrying out experiments or simulations to determine probabilities.
- construct a sample space to determine probabilities.
- describe the power of using a probability model by comparing experimental results with mathematical expectations.
- make predictions that are based on experimental or theoretical probabilities and determine their reasonableness.
- develop and explain an appreciation for the pervasive use of probability in the real world.

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[11] See note 10.

MCAS Reporting Categories

In *Test Item Analysis Reports* and on the *Subject Area Subscore* pages of the MCAS *School* and *District Reports,* Mathematics test results are reported under the following four MCAS reporting categories, which are identical to the four *Mathematics Curriculum Framework* content strands:[12]

- Number Sense
- Patterns, Relations, and Functions
- Geometry and Measurement
- Statistics and Probability

[12] Please note that these MCAS reporting categories differ from those listed in the 1998 publication, *Guide to the Massachusetts Comprehensive Assessment System: Mathematics.* The reporting categories listed in that publication are referenced as **substrands** in this document.

MCAS Spring 2000 Common Test Items
Mathematics, Grade 8

Test Sessions

MCAS grade 8 Mathematics Student Test Booklets contained 3 separate test sessions. Each session included multiple-choice and open-response questions. Session 1 also included short-answer questions.

Reference Materials and Tools

During testing, each grade 8 student was provided with a **Mathematics Reference Sheet.** A sample of the Grade 8 Mathematics Reference Sheet is included in Appendix A of this document.

During Sessions 2 and 3, each grade 8 student was allowed to use a personal calculator while answering test questions. If any student could not provide his or her own calculator with at least four functions and a square root key, one was provided to that student for use during those sessions. Calculator use was not allowed during Session 1.

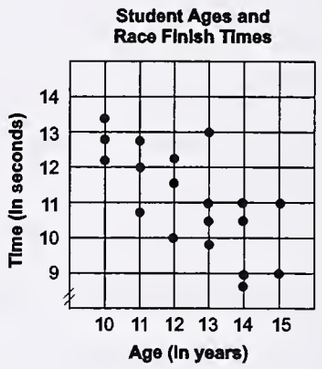
No other reference tools or materials were allowed during any grade 8 Mathematics test session.

Cross-Reference Information

The shaded bar underneath each item indicates the item's MCAS reporting category and the *Framework* substrand that contains the learning standards assessed by the item. The parentheses indicate the page(s) in this document where the learning standards may be found.

Session 1, Multiple-Choice Questions

Use the scatter plot to answer question 1.



1. In the scatter plot, each dot represents one student who participated in the 50-meter race. Ben is 15 years old. Based on the information in the scatter plot, what was Ben's time in the race?

   A. 9 seconds

   B. 10 seconds

   C. 11 seconds

✔ D. It cannot be determined.

Reporting Category/Substrand for Item 1: ***Statistics and Probability*/Statistics (p. 145)**

2. Which of the following is **closest** to 0.816×0.211?

✔ A. 0.16

   B. 16

   C. 1.6

   D. 160

Reporting Category/Substrand for Item 2: ***Number Sense*/Computation and Estimation (p. 142)**

3. A chemical solution is 0.5% iodine. How many milliliters of iodine are in 1,000 mL of solution?

   A. 0.5 mL

✔ B. 5 mL

   C. 50 mL

   D. 500 mL

Reporting Category/Substrand for Item 3: ***Number Sense*/Computation and Estimation (p. 142)**

Use the balance scales below to answer question 4.

Figure 1

Figure 2

4. How many cylinders must be placed on the empty side of the second scale to make that scale balance?

✔ A. 5

B. 2

C. 3

D. 4

Reporting Category/Substrand for Item 4: ***Patterns, Relations, and Functions*/Algebra (p. 143)**

5. What number comes next in this sequence?

5, 6, 9, 14, 21, _____

A. 26

B. 27

✔ C. 30

D. 32

Reporting Category/Substrand for Item 5: ***Patterns, Relations, and Functions*/Patterns and Functions (p. 143)**

Session 1, Short-Answer Questions

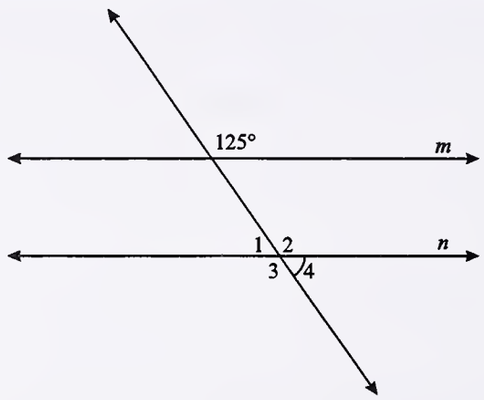
6. Compute:

$$35.2 - 5.74 =$$

Correct Answer: 29.46

Reporting Category/Substrand for Item 6: ***Number Sense*/Computation and Estimation (p. 142)**

Use the figure below to answer question 7.



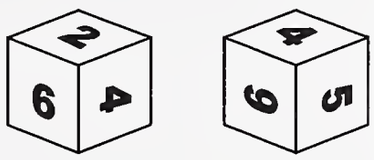
7. Lines m and n are parallel. What is the measure of $\angle 4$?

Correct Answer: 55°

Reporting Category/Substrand for Item 7: ***Geometry and Measurement*/Geometry (p. 144)**

Session 1, Open-Response Question

8. John is playing a board game that uses a pair of number cubes with sides numbered 1 to 6.



To find how many spaces he can move on the board, he adds the two numbers he rolls. The possible sums are

2, 3, 4, 5, 6, 7, 8, 9, 10, 11, and 12.

a. Are all the sums John can roll equally likely? Explain your reasoning in detail.

b. John needs to roll a sum of exactly 11 in order to get another turn. What is the probability that he will roll a sum of exactly 11? Explain your reasoning in detail.

Reporting Category/Substrand for Item 8: ***Statistics and Probability*/Probability (p. 145)**

Session 1, Short-Answer Questions

9. Compute:

$$43.68 \times 2.5 =$$

Correct Answer: 109.2

Reporting Category/Substrand for Item 9: ***Number Sense*/Computation and Estimation (p. 142)**

10. Write the rule for the table shown below.

Input (x)	Output (y)
3	5
6	11
2	3
8	15

Correct Answers:
$2x - 1$ *or* $x + (x - 1)$

Reporting Category/Substrand for Item 10: ***Patterns, Relations, and Functions*/Patterns and Functions (p. 143)**

11. What does y equal in the equation below?

$$6 - 2y = -8$$

Correct Answer: 7

Reporting Category/Substrand for Item 11: ***Patterns, Relations, and Functions*/Algebra (p. 143)**

Session 1, Open-Response Question

12. Erin is writing a science fiction story. She has invented a money system for her planet that uses four coins that she drew and named like this:

She has challenged her classmates to determine the relationships among the values of the coins from the following clues.

CLUE 1:
3 Cs are worth the same as 1 T and 1 C.

CLUE 2:
Kay bought a game costing H R R.
She gave the clerk 2 Hs. Her change was 1 R.

CLUE 3:
Kay and Max have the same amount of money.
Kay has 1 R, 4 Cs, and 1 H.
Max has 3 Rs and 6 Ts.

a. Use Clue 1 above to find how many C s equal 1 T . Use words or pictures to explain your reasoning.

b. Use Clue 2 to find how many R s equal 1 H . Use words or pictures to explain your reasoning.

c. Use Clue 3 and your answers to parts a and b to find how many T s equal 1 R. Use words or pictures to explain your reasoning.

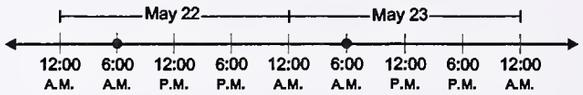
d. Erin told her classmates that 1 C is worth 25¢ in U.S. money. What is the value in U.S. money of **each** of the following?

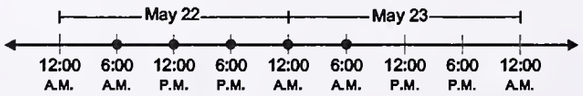
- 1 T
- 1 R
- 1 H

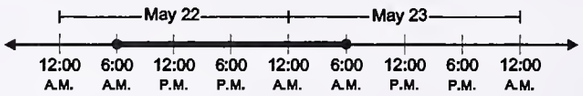
Reporting Category/Substrand for Item 12: ***Patterns, Relations, and Functions*/Algebra (p. 143)**

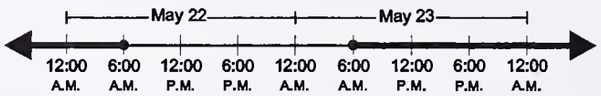
Session 2, Multiple-Choice Questions

13. NASA says conditions will be right for launching the space shuttle from 6:00 A.M. on May 22 to 6:00 A.M. on May 23. Which graph shows when the shuttle can be launched?

A.


B.


✔ C.


D.


Reporting Category/Substrand for Item 13: ***Patterns, Relations, and Functions*/Patterns and Functions (p. 143)**

14. Which expression tells how much money a shopper has left if x represents the amount the shopper started with and s represents the amount spent?

A. $s - x$

B. $s + x$

C. $x \div s$

✔ D. $x - s$

Reporting Category/Substrand for Item 14: ***Patterns, Relations, and Functions*/Algebra (p. 143)**

15. The following shows the first five rows of Pascal's triangle.

Row 1: 1
Row 2: 1 1
Row 3: 1 2 1
Row 4: 1 3 3 1
Row 5: 1 4 6 4 1

Which of the following represents the 8th row?

✔ A. 1 7 21 35 35 21 7 1

B. 1 7 21 35 21 7 1

C. 1 5 5 10 10 5 5 1

D. 1 5 10 10 5 1

Reporting Category/Substrand for Item 15: ***Patterns, Relations, and Functions*/Patterns and Functions (p. 143)**

16. A bag contains 2 blue, 6 black, and 4 white socks. Paula is going to draw out a sock without looking in the bag. What is the probability that she will draw **either** a blue **or** a black sock?

A. $\frac{1}{6}$

B. $\frac{1}{3}$

C. $\frac{1}{2}$

✔ D. $\frac{2}{3}$

Reporting Category/Substrand for Item 16: ***Statistics and Probability*/Probability (p. 145)**

17. The formula for the surface area *(SA)* of a cube is

$$SA = 6e^2, \text{ where } e \text{ is the length of an edge of the cube.}$$

An edge of a red cube is twice as long as an edge of a blue cube. How many times greater is the surface area of the red cube than that of the blue cube?

A. 2 times greater

✔ B. 4 times greater

C. 6 times greater

D. 12 times greater

Reporting Category/Substrand for Item 17: ***Patterns, Relations, and Functions*/Algebra (p. 143)**

18. Which of the following measurements would **most likely** be given with a **negative** exponent in scientific notation?

✔ A. the diameter of a blood cell in centimeters

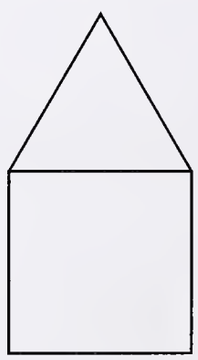
B. the distance to the Sun in kilometers

C. the weight of a pencil in grams

D. the mass of a rocket in kilograms

Reporting Category/Substrand for Item 18: ***Number Sense*/Number and Number Relationships (p. 141)**

19. In the figure on the right, the perimeter of the equilateral triangle is 24 inches.
What is the **area** of the square?



A. 32 sq. in.

✔ B. 64 sq. in.

C. 476 sq. in.

D. 12 sq. in.

Reporting Category/Substrand for Item 19: ***Geometry and Measurement*/Measurement (p. 144)**

20. The Massachusetts Department of Employment and Training predicted that there will be 21% more jobs for computer programmers in Massachusetts in 2005 than there were in 1994. There were 15,970 programming jobs in 1994. Based on the prediction, about how many new jobs will be available by 2005?

    A. 350

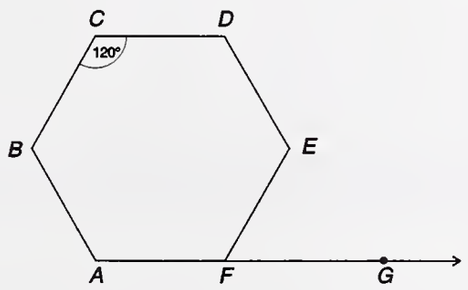
    B. 750

    C. 2,750

✔ D. 3,350

Reporting Category/Substrand for Item 20: ***Number Sense*/Computation and Estimation (p. 142)**

Use the regular hexagon below to answer question 21.



21. How many degrees are in $\angle EFG$?

    A. 80°

    B. 240°

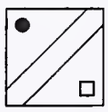
✔ C. 60°

    D. 120°

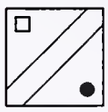
Reporting Category/Substrand for Item 21: ***Geometry and Measurement*/Geometry (p. 144)**

22. The following figure is to be rotated 90° clockwise.

What will the figure look like after the rotation?

A. 

B.

C. 

✔ D.

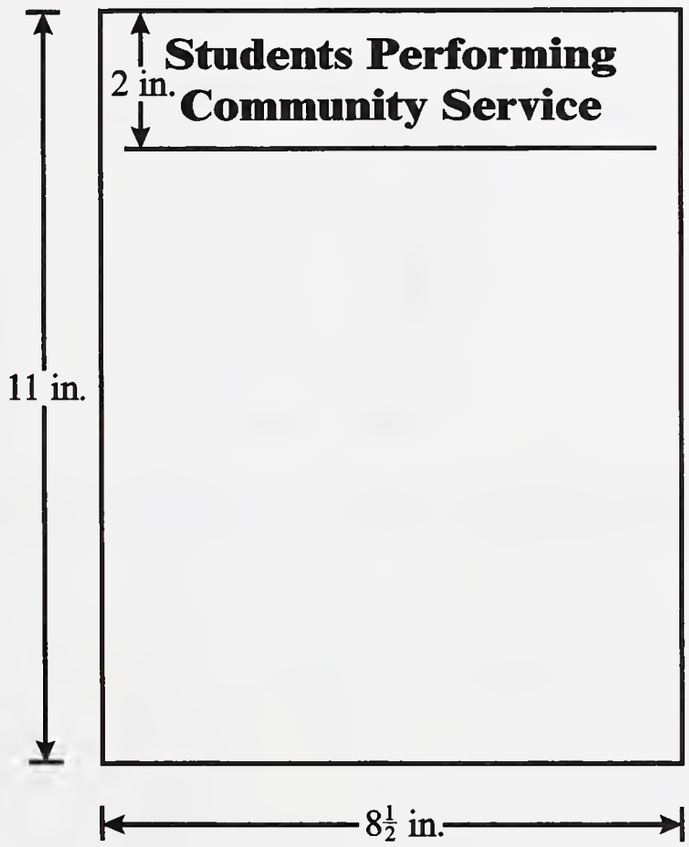
Reporting Category/Substrand for Item 22: ***Geometry and Measurement*/Geometry (p. 144)**

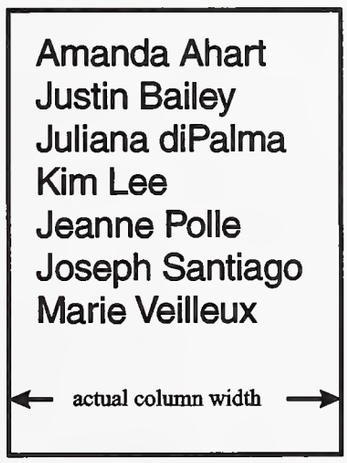
Session 2, Open-Response Question

Use your ruler to answer this open-response question.

23. Jarrod is the editor of the school newspaper. In the next issue, a page will be devoted to a list of the students who perform community service. Jarrod is planning how to arrange the names.

    The first figure below tells the size of the page and the headline. The second figure shows the actual size of type that will be used for the students' names and the actual width of each column.





Actual size of type and column width, including margins.

There are 175 students who performed community service. Jarrod wants to plan the page so that

- the page has the greatest number of columns possible, and
- the columns are as close to the same length as possible.

a. What is the greatest number of columns that Jarrod can put on the page? Show or describe how you found your answer.

b. How many names should he put in each column so that the columns are of equal length or as close to equal length as possible? Assume each name will fit on one line in a column.

c. How long will each column of names be? Show or describe how you found your answer.

Reporting Category/Substrand for Item 23: ***Geometry and Measurement/Measurement*** **(p. 144)**

Session 3, Multiple-Choice Questions

24. Jasmine needs to reduce the height of a picture from 3 inches to 2 inches so it will fit in the school yearbook. The new height is what percent of the original height?

✔ A. $66\frac{2}{3}\%$

B. $33\frac{1}{3}\%$

C. 50%

D. 75%

Reporting Category/Substrand for Item 24: ***Number Sense*/Computation and Estimation (p. 142)**

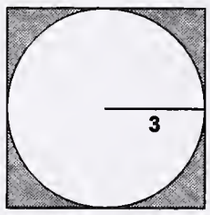
25. What is the area of the **shaded** region in the figure below? (Use 3.14 for π.)

A. 5.15 sq. units

B. 17.16 sq. units

✔ C. 7.74 sq. units

D. 21.72 sq. units



Reporting Category/Substrand for Item 25: ***Geometry and Measurement*/Geometry (p. 144)**

Use the following table to answer question 26.

Lowest Recorded Temperatures

Boston	–12°F
Hartford	–26°F
Mobile	3°F

26. Which lists the cities in order from the one with the lowest recorded temperature to the one with the highest?

A. Boston, Hartford, Mobile

✔ B. Hartford, Boston, Mobile

C. Mobile, Boston, Hartford

D. Mobile, Hartford, Boston

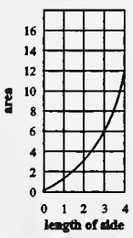
Reporting Category/Substrand for Item 26: ***Number Sense*/Number Systems and Number Theory (p. 142)**

27. The formula for the area, A, of a square is:

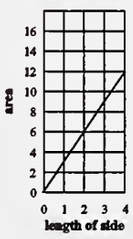
$A = s^2$, where s is the length of the side of the square.

Which graph shows the relationship between the length of one side of a square and its area?

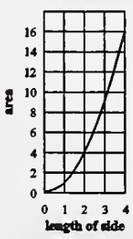
A.



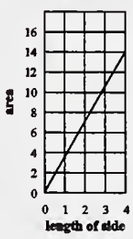
B.



✔ C.



D.



Reporting Category/Substrand for Item 27: ***Patterns, Relations, and Functions*/Algebra (p. 143)**

28. The diagonal of a square is 25 units long. Which is the approximate length of a side of the square?

✔ A. 18 units

B. 15 units

C. 5 units

D. 13 units

Reporting Category/Substrand for Item 28: ***Geometry and Measurement*/Measurement (p. 144)**

29. Chris selected 50 students at random and asked them who they want for class president. The results are shown in the table below.

Candidate	Frequency
Jessica	30
Jeremy	4
Monique	16

Which statement is true regarding the probability that at least 5 of the next 10 students interviewed will want Jeremy for president?

A. It is impossible.

✔ B. It is unlikely.

C. It is likely.

D. It is certain.

Reporting Category/Substrand for Item 29: ***Statistics and Probability*/Probability (p. 145)**

30. Kathy rode her bicycle from her house to the top of a nearby hill. First, she traveled very fast on a level road. Then, she traveled more and more slowly as she went up the hill. Which graph best shows the distance she traveled over time?

✔ A.

B.

C.

D.

Reporting Category/Substrand for Item 30: ***Patterns, Relations, and Functions*/Patterns and Functions (p. 143)**

31. Suppose that for a positive number n,

$$n \div 7 = a \quad \text{and} \quad n \div 8 = b.$$

How do a and b compare?

A. $a < b$

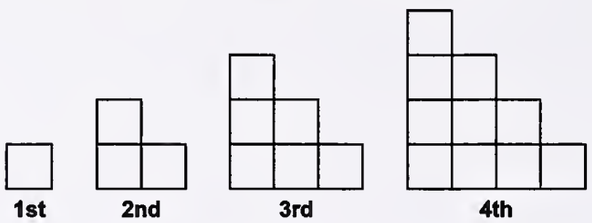
B. $a = b$

✔ C. $a > b$

D. It depends on the value of n.

Reporting Category/Substrand for Item 31: ***Number Sense*/Number Systems and Number Theory (p. 142)**

32. Each arrangement in the pattern below is made up of square tiles.



Which expression tells how many tiles are in the nth arrangement of this pattern?

A. $n(n + 1)$

B. $n(n - 1)$

C. $2n - 1$

✔ D. $\frac{n}{2}(n + 1)$

Reporting Category/Substrand for Item 32: ***Patterns, Relations, and Functions*/Algebra (p. 143)**

33. How does 80% of a number greater than 0 compare with that number?

A. It is greater than that number.

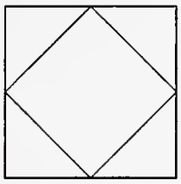
✔ B. It is less than that number.

C. It is equal to that number.

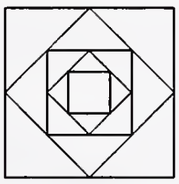
D. It depends on the number.

Reporting Category/Substrand for Item 33: ***Number Sense*/Number and Number Relationships (p. 141)**

34. Myra drew a square. She drew another square inside the first square as shown below.



Then she drew a square inside her second square, a square inside her third square, and so on. After she had drawn five squares, her figure looked like this:



Which expression tells the number of right angles in Myra's figure after she drew exactly n squares?

A. $2n$

✔ B. $4n$

C. n^2

D. $2n^2$

Reporting Category/Substrand for Item 34: ***Patterns, Relations, and Functions*/Patterns and Functions (p. 143)**

35. The Massachusetts Highway Department is responsible for more than 66.5 million feet of roadway in Massachusetts. **About** how many miles is 66.5 million feet?

A. 4,200 miles

B. 35,100 miles

✔ C. 12,600 miles

D. 11,700 miles

Reporting Category/Substrand for Item 35: ***Geometry and Measurement*/Measurement (p. 144)**

36. Which of the following terms best completes this sentence?

Triangle is to equilateral triangle as quadrilateral is to _____.

A. rectangle

B. trapezoid

C. parallelogram

✔ D. square

Reporting Category/Substrand for Item 36: ***Geometry and Measurement*/Geometry (p. 144)**

37. When Matt's and Damien's broad jumps were measured **accurately to the nearest foot,** each measurement was 21 feet. Which statement best describes the greatest possible difference in the lengths of Matt's jump and Damien's jump?

A. One jump could be up to $\frac{1}{4}$ foot longer than the other.

B. One jump could be up to $\frac{1}{2}$ foot longer than the other.

✔ C. One jump could be up to 1 foot longer than the other.

D. One jump could be up to 2 feet longer than the other.

Reporting Category/Substrand for Item 37: ***Geometry and Measurement*/Measurement (p. 144)**

Session 3, Open-Response Questions

38. The planning committee at Lane Middle School is planning a pizza party for its 127 eighth-grade students. They got this menu from The Pizza Palace.

The planning committee took a survey of a random sample of 26 eighth-grade students by asking, "What kind of pizza do you want?" This is what they found.

Favorite Kind of Pizza				
Kind of pizza	Cheese	Sausage	Pepperoni	Vegetarian
Number of students	7	3	9	7

The committee has a budget of $300 for the pizza. What kinds and sizes of pizzas could the committee order so that each of the 127 students can have his or her favorite kind of pizza?

a. Explain how you used the results of the survey to decide which pizzas to order.

b. Show or describe the calculations needed to be sure that there will be enough pizza for the 127 students.

c. Show or describe the calculations needed to be sure that the cost of the pizzas totals $300 or less.

You do **not** need to find the cheapest way to buy enough pizza. You only need to make sure that the total cost is $300 or less.

Reporting Category/Substrand for Item 38: ***Number Sense*/Computation and Estimation (p. 142)**

39. For Tiffany and Miguel's science fair project, they dropped the same ball from a height of 200 centimeters 20 times. Each time they dropped the ball, they measured how high it bounced on its first four bounces. The table below gives the average of their measurements.

Average Height of Ball Bounces (drop height = 200 cm)	
Height of 1st bounce	153 cm
Height of 2nd bounce	110 cm
Height of 3rd bounce	86 cm
Height of 4th bounce	63 cm

a. Using the grid in your answer booklet, draw a graph showing the data in the table. Be sure to label the axes.

b. Predict the height of the 5th bounce.

c. Describe the pattern that can be used to predict the height of the bounces.

Reporting Category/Substrand for Item 39: ***Statistics and Probability*/Statistics (p. 145)**

VII. Mathematics,

Grade 10

Mathematics, Grade 10

The spring 2000 MCAS Mathematics test was based on the learning standards of the Massachusetts *Mathematics Curriculum Framework* (1996). The *Framework* identifies four major content strands:

- Number Sense
- Patterns, Relations, and Functions
- Geometry and Measurement
- Statistics and Probability

At grade 10, the *Framework* divides each strand into multiple substrands. These substrands are specifically referenced in the MCAS document, *Guide to Interpreting the 2000 MCAS Reports for Schools and Districts,* due for release later in 2000.

Curriculum Framework *Learning Standards*

Learning standards are grouped below by substrand and are directly quoted from the *Framework;* applicable *Framework* page numbers are shown in parentheses.

Number Sense

Discrete Mathematics (*Framework*, p. 44)

Students engage in problem solving, communicating, reasoning, and connecting to

- represent problem situations, using discrete structures such as finite graphs, matrices, sequences, and recurrence relations.
- represent and analyze finite graphs, using matrices.

Mathematical Structure (*Framework*, p. 45)

Students engage in problem solving, communicating, reasoning, and connecting to

- compare and contrast the real number system and its subsystems with regard to structural characteristics.
- demonstrate the logic of algebraic procedures and their interrelationship with geometric ideas and concepts.

Estimation (*Framework*, p. 46)

Students engage in problem solving, communicating, reasoning, and connecting to

- use estimation strategies to judge the reasonableness of results of computation and problem solving involving real numbers.
- use estimation when making graphs.

Patterns, Relations, and Functions

Algebra (*Framework*, p. 62)

Students engage in problem solving, communicating, reasoning, and connecting to

- formulate problems that involve variable quantities with expressions, equations, and inequalities.
- use tables and graphs as tools to interpret expressions, equations, and inequalities.
- simplify algebraic expressions to solve equations and inequalities.

Functions (*Framework*, p. 63)

Students engage in problem solving, communicating, reasoning, and connecting to

- model real-world phenomena with a variety of functions.
- represent and analyze relationships, using tables, verbal rules, equations, and graphs.
- translate among tabular, symbolic, and graphical representations of functions.

Trigonometry (*Framework*, p. 64)

Students engage in problem solving, communicating, reasoning, and connecting to

- apply trigonometry to problem situations involving right triangles.

Geometry and Measurement

Geometry and Spatial Sense (*Framework,* p. 78)[13]

Students engage in problem solving, communicating, reasoning, and connecting to

- interpret and draw three-dimensional objects.
- represent problem situations with geometric models and apply properties of figures.
- classify figures in terms of congruence and similarity and apply these relationships.
- deduce properties of, and relationships between, figures from given assumptions.
- develop and defend conclusions.
- formulate counter examples.
- construct proofs for mathematical assertions, including indirect proofs and proofs by mathematical induction.

Measurement (*Framework,* p. 78)[14]

- represent problem situations with geometric models and apply properties of figures.
- classify figures in terms of congruence and similarity and apply these relationships.
- deduce properties of, and relationships between, figures from given assumptions.

Geometry from an Algebraic Perspective (*Framework,* p. 79)

Students engage in problem solving, communicating, reasoning, and connecting to

- translate between synthetic and coordinate representations.
- deduce properties of figures, using transformations and coordinates.
- identify congruent and similar figures, using transformations.
- develop and explain geometric interpretations and applications of slope.

---

[13] The two MCAS subcategories, *Geometry and Spatial Sense* and *Measurement,* mentioned on pages 120 and 123 of the MCAS document, *Guide to the Massachusetts Comprehensive Assessment System: Mathematics,* have been recombined in 2000 to be reported as *Geometry and Spatial Sense.*

[14] See note 13.

Statistics and Probability

Statistics (*Framework*, p. 94)

Students engage in problem solving, communicating, reasoning, and connecting to

- construct, draw inferences, and reason with charts, tables, and graphs that summarize data from real-world situations.
- use sampling to recognize and describe its role in statistical claims.
- design a statistical experiment to study a problem, conduct the experiment, and interpret and communicate the outcomes.

Probability (*Framework*, p. 95)

Students engage in problem solving, communicating, reasoning, and connecting to

- use simulations to estimate probabilities.
- determine the likelihood of outcomes, using theoretical probabilities.

MCAS Reporting Categories

In *Test Item Analysis Reports* and on the *Subject Area Subscore* pages of the MCAS *School* and *District Reports,* Mathematics test results are reported under the following four MCAS reporting categories, which are identical to the four *Mathematics Curriculum Framework* content strands:[15]

- Number Sense
- Patterns, Relations, and Functions
- Geometry and Measurement
- Statistics and Probability

[15] Please note that these MCAS reporting categories differ from those listed in the 1998 publication, *Guide to the Massachusetts Comprehensive Assessment System: Mathematics.* The reporting categories listed in that publication are referenced as **substrands** in this document.

MCAS Spring 2000 Common Test Items
Mathematics, Grade 10

Test Sessions

MCAS grade 10 Mathematics Student Test Booklets contained 3 separate test sessions. Each session included multiple-choice and open-response questions. Session 1 also included short-answer questions.

Reference Materials and Tools

During testing, each grade 10 student was provided with a **Mathematics Reference Sheet.** A sample of the Grade 10 Mathematics Reference Sheet is included in Appendix A of this document.

During Sessions 2 and 3, each grade 10 student was allowed to use a personal calculator while answering test questions. If any student could not provide his or her own calculator with at least four functions and a square root key, one was provided to that student for use during those sessions. Calculator use was not allowed during Session 1.

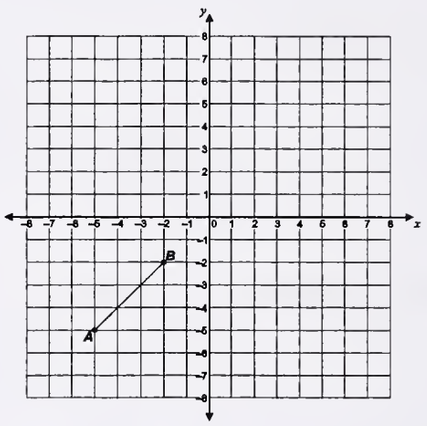
No other reference tools or materials were allowed during any grade 10 Mathematics test session.

Cross-Reference Information

The shaded bar underneath each item indicates the item's MCAS reporting category and the *Framework* substrand that contains the learning standards assessed by the item. The parentheses indicate the page in this document where the learning standards may be found.

Session 1, Multiple-Choice Questions

Use the graph to answer question 1.



1. Suppose that $\overline{AB}$ is translated 6 units to the right. What are the coordinates of the image of point B?

   A. (–4,–2)

   B. (–4,2)

   ✔ C. (4,–2)

   D. (4,2)

Reporting Category/Substrand for Item 1: ***Geometry and Measurement*/Geometry from an Algebraic Perspective (p. 173)**

2. Mark drives 25% of the time in the city and 75% of the time on the highway. Which of the four cars listed below will give him the greatest number of miles per gallon of gasoline?

	average miles per gallon in the city	average miles per gallon on the highway
A. Car #1	20	35
B. Car #2	25	30
✔ C. Car #3	24	34
D. Car #4	26	31

Reporting Category/Substrand for Item 2: ***Number Sense*/Mathematical Structure (p. 171)**

3. If $3(2r - 5) = 27$, then $2r - 5$ equals

   A. 30.

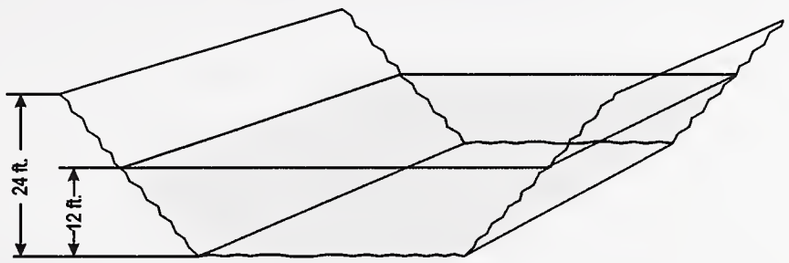
   B. 24.

   C. 81.

   ✔ D. 9.

Reporting Category/Substrand for Item 3: ***Number Sense*/Discrete Mathematics (p. 171)**

Use the diagram below to answer question 4.



4. A canal is 24 feet deep and has slanted sides as shown in the cross section of the canal above. The water level is at 12 feet now. How does the amount of water in the canal now compare to the amount in the canal when it is full?

   A. It is more than half as much.

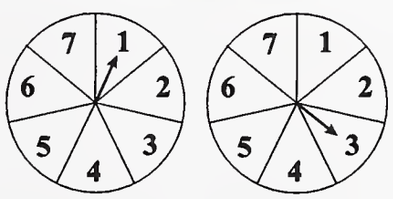
   B. It is half as much.

✔ C. It is less than half as much.

   D. It is twice as much.

Reporting Category/Substrand for Item 4: ***Geometry and Measurement*/Geometry and Spatial Sense (p. 173)**

Use the spinners to answer question 5.



5. When playing a board game, you spin two spinners with congruent sectors numbered 1 through 7 as shown. If the **sum** of the two numbers you spin is 12, 13, or 14, you win. What is the probability of winning?

   A. $\frac{21}{49}$

   B. $\frac{10}{49}$

   C. $\frac{15}{49}$

✔ D. $\frac{6}{49}$

Reporting Category/Substrand for Item 5: ***Statistics and Probability*/Probability (p. 174)**

6. The lawn in Lori's backyard is a 30-foot by 50-foot rectangle. Lori converts part of the lawn to a circular garden 8 feet in diameter. What fractional part of her backyard is garden space?

✔ A. $\frac{16\pi}{1,500}$

B. $\frac{64\pi}{1,500}$

C. $\frac{8\pi}{1,500}$

D. $\frac{8\pi}{1,550 - 8\pi}$

Reporting Category/Substrand for Item 6: ***Geometry and Measurement*/Geometry and Spatial Sense (p. 173)**

7. Haynes High School chartered buses for 60 students to go on a field trip. Valley High School chartered buses for 80 students.

   - The total cost of the buses was the same for the two schools.
   - Students from Valley High School paid $5 less than students from Haynes High School.

   What was the cost per student for Haynes High School?

   A. $5

   B. $15

✔ C. $20

   D. $40

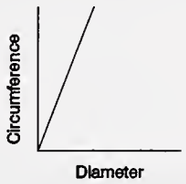
Reporting Category/Substrand for Item 7: ***Patterns, Relations, and Functions*/Algebra (p. 172)**

8. The circumference, C, of a circle is found by using the formula

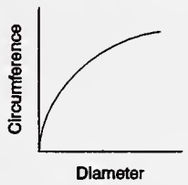
$$C = \pi d, \text{ where } d \text{ is the diameter.}$$

Which graph best shows the relationship between the diameter of a circle and its circumference?

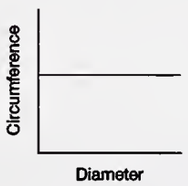
✔ A.



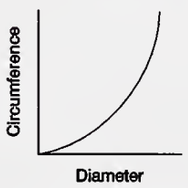
B.



C.



D.



Reporting Category/Substrand for Item 8: ***Patterns, Relations, and Functions*/Functions (p. 172)**

9. A movie projector positioned 28 feet from a wall creates an image that is 7 feet wide on the wall. If a screen is placed 5 feet in front of the projector, what will be the width of the image on the screen?

A. less than 1 foot

✔ B. between 1 and 2 feet

C. between 3 and 4 feet

D. greater than 4 feet

Reporting Category/Substrand for Item 9: ***Geometry and Measurement*/Geometry and Spatial Sense (p. 173)**

10. Mr. Spruce displayed the student scores in math class using the stem-and-leaf plot shown below.

9	4 4 3 0
8	9 7 6 5 5 5 5 3 1
7	7 7 7 5 3 2 1
6	9 5 0
5	4

Note: 8 | 9 = 89

The median student score is

✔ A. 82.

B. 81.

C. 88.

D. 85.

Reporting Category/Substrand for Item 10: ***Statistics and Probability*/Statistics (p. 174)**

Session 1, Short-Answer Questions

11. Solve the following equation for x.

$$0.5(x - 8) = 0.2x + 11$$

Correct Answer: x=50

Reporting Category/Substrand for Item 11: ***Patterns, Relations, and Functions*/Algebra (p. 172)**

12. What is the missing term in the quadratic expression below?

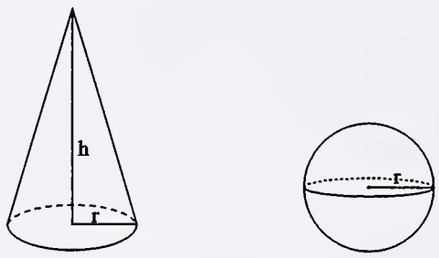
$$(2x - 3)(x + 4) = 2x^2 + ___ - 12$$

Correct Answer: $5x$

Reporting Category/Substrand for Item 12: ***Patterns, Relations, and Functions*/Algebra (p. 172)**

Session 1, Open-Response Question

Use the cone and sphere below to answer question 13.



13. a. If the height of the cone is **doubled,** the volume of the cone is how many times larger?

    b. If the radius of the cone is **doubled,** the volume of the cone is how many times larger?

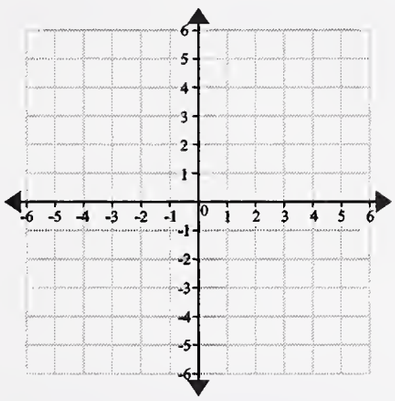
    c. If the radius of the sphere is **doubled,** the volume of the sphere is how many times larger?

    d. A manufacturing company wants to make one cone-shaped container and one sphere-shaped container that each have the **same** radius and the **same** volume. What must be the height of the cone in terms of its radius? Explain your reasoning.

Reporting Category/Substrand for Item 13: ***Geometry and Measurement*/Geometry and Spatial Sense (p. 173)**

Session 1, Short-Answer Questions

You may want to use the following grid to help you answer question 14.

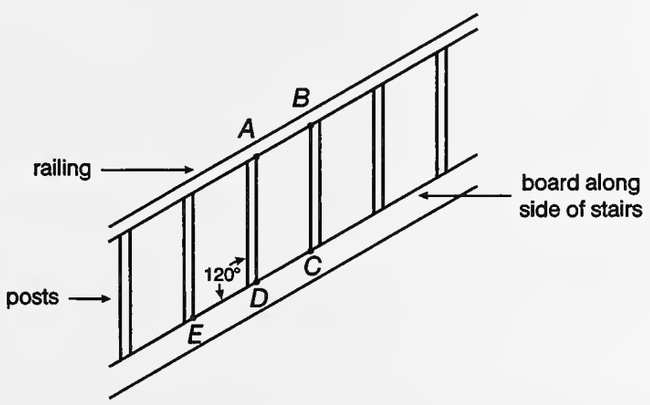


14. What are the coordinates of the midpoint of a line segment with endpoints (–3,–1) and (5,3)?

Correct Answer: (1,1)

Reporting Category/Substrand for Item 14: ***Geometry and Measurement*/Geometry from an Algebraic Perspective (p. 173)**

Use the figure below to answer question 15.



15. Ms. Barnes is building a railing for her stairs. The board along the side of the stairs, the railing, and the posts form parallelograms. If $\angle EDA$ shown in the figure measures 120°, what is the measure of $\angle ABC$?

Correct Answer: 60°

Reporting Category/Substrand for Item 15: ***Geometry and Measurement*/Geometry and Spatial Sense (p. 173)**

Session 1, Open-Response Question

16. A 15-player tournament consists of a series of matches between two contestants. A contestant is eliminated after losing one match. When there is an odd number or players, one player is **not** paired with a partner and automatically advances to the next round as though he/she had won a match.

    a. Draw a diagram to show how the tournament could be set up.

    b. What is the smallest number of two-contestant matches that the winner must play in order to become the champion?

    c. What is the **total** number of matches that must be played in the tournament to determine a winner?

    d. Suppose 63 people entered a similar tournament. What is the total number of matches that must be played in the tournament to determine a winner?

Reporting Category/Substrand for Item 16: ***Statistics and Probability*/Probability (p. 174)**

Session 2, Multiple-Choice Questions

Use the table on the right to answer question 17.

x	2	6	8	12	14
y	3	27	39	63	75

17. Which equation shows the relationship between x and y in the table?

A. $y = 9x - 6$

✔ B. $y = 6x - 9$

C. $y = -6x - 9$

D. $y = -9x + 6$

Reporting Category/Substrand for Item 17: ***Patterns, Relations, and Functions*/Functions (p. 172)**

18. The identity element for the operation of addition is 0 since $0 + x = x$ and $x + 0 = x$ for any real number x. The operation $\circledast$ is defined by the following table.

$\circledast$	a	b	c	d
a	d	c	b	a
b	c	d	a	b
c	b	a	d	c
d	a	b	c	d

What is the identity element for the operation $\circledast$?

A. a

B. b

C. c

✔ D. d

Reporting Category/Substrand for Item 18: ***Number Sense*/Discrete Mathematics (p. 171)**

Use the picture of the cards to answer question 19.

19. Each of the letters **M**, **A**, **T**, and **H** appear on the reverse side of one of the four cards on the right (one letter per card), but not necessarily in that order. If the cards are turned over, what is the probability that they will be ordered so that they spell the word **MATH**?

A. $\frac{1}{4}$

B. $\frac{1}{12}$

✔ C. $\frac{1}{24}$

D. $\frac{1}{48}$

Reporting Category/Substrand for Item 19: ***Statistics and Probability*/Probability (p. 174)**

20. Which of the following is an irrational number?

A. $\frac{1}{3}$

B. $0.\overline{304}$

C. $\sqrt{0.9216}$

✔ D. $\frac{\pi}{10}$

Reporting Category/Substrand for Item 20: ***Number Sense*/Discrete Mathematics (p. 171)**

Session 2, Open-Response Questions

21. An automobile is purchased for $18,000. Its value decreases each year according to the following schedule:

    - The car's value decreases by 30% in the first year.
    - After the first year, its value decreases by 20% each year.

    a. What is the value of this car at the end of one year? Explain or show how you found your answer.

    b. During which year will the car's value decrease to less than half its original price? Explain or show how you found your answer.

    c. Suppose the value of another car, which also costs $18,000, decreases at the rate of 25% each year. Which car would have the greater value 3 years after it was purchased? Explain or show how you found your answer.

Reporting Category/Substrand for Item 21: ***Number Sense*/Mathematical Structure (p. 171)**

22. The power, P, generated in an hour by the windmill on Jones's farm is proportional to the cube of the wind speed, V, as shown by the formula

$$P = 0.015V^3$$

    where P is measured in watts and V is measured in miles per hour.

    a. Calculate the amount of power that the Jones's windmill would generate in an hour with a steady wind of 8 mph.

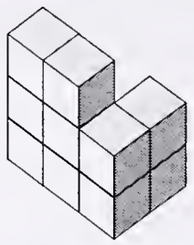
    b. What wind speed is needed for the windmill to produce 120 watts of power in an hour? Explain or show how you found your answer.

    c. Matt says that if the wind blew at 4 mph for one hour and then 12 mph for another hour the amount of power generated by the windmill would be the same as the amount generated by an 8 mph wind in two hours. Laurel disagrees. Who is correct? Justify your answer mathematically.

Reporting Category/Substrand for Item 22: ***Patterns, Relations, and Functions*/Functions (p. 172)**

Session 3, Multiple-Choice Questions

Use the figure on the right to answer question 23.

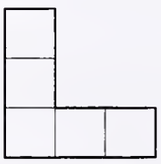


23. Which diagram could **not** possibly show how the figure looks when it is viewed directly from above?

A.

B.

C.

✔ D. 

Reporting Category/Substrand for Item 23: ***Geometry and Measurement*/Geometry and Spatial Sense (p. 173)**

24. Which of the following is true for all possible values of x?

A. $3(x + 1) = 3x + 1$

✔ B. $2(x + 3) = 2x + 6$

C. $4(2x + 1) = 6x + 5$

D. $5(3x - 2) = 15x - 7$

Reporting Category/Substrand for Item 24: ***Patterns, Relations, and Functions*/Algebra (p. 172)**

25. The following table shows the total number of line segments that can be drawn connecting two points in a set of coplanar, noncollinear points.

Number of Points	3	4	5	6	...	10	11
Number of Line Segments	3	6	10	15	...	45	?

How many line segments can be drawn connecting two points in a set of 11 noncollinear points?

✔ A. 55

B. 50

C. 48

D. 110

Reporting Category/Substrand for Item 25: ***Number Sense*/Estimation (p. 172)**

26. Four hundred deer were captured in Milltown Forest, tagged, and released back into the forest. Several weeks later, a forest ranger captured a number of deer at a random location in Milltown Forest, recorded the number of tagged and nontagged deer, and released the deer back into the forest. She did this over two trials as shown below.

Record of Deer Captured in Milltown Forest

	Total of Deer	Tagged	Nontagged
Trial 1	65	10	55
Trial 2	75	15	60

Approximately how many deer could you expect to find in the entire forest?

A. 2,600

B. 1,600

✔ C. 2,300

D. 1,000

Reporting Category/Substrand for Item 26: ***Statistics and Probability*/Statistics (p. 174)**

Use the matrix equation on the right to answer question 27.

$$\begin{bmatrix} 1 & -3 \\ 3 & 1 \end{bmatrix} \cdot \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 12 \\ 18 \end{bmatrix}$$

27. The matrix equation represents which system of equations?

✔ A. $x - 3y = 12$
$3x + y = 18$

B. $x + 3y = 12$
$-3x + y = 18$

C. $1 - 3x = 12$
$3 + y = 18$

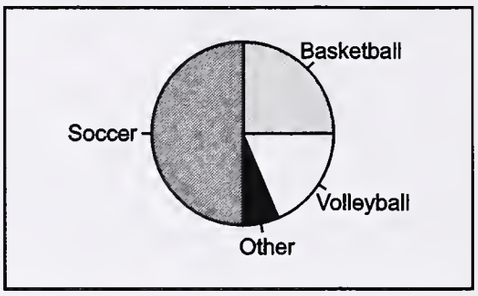
D. $-3x = 12$
$3y = 18$

Reporting Category/Substrand for Item 27: ***Number Sense*/Discrete Mathematics (p. 171)**

Use the graph that shows the results of a survey to answer question 28.

28. Based on the graph, which is the best estimate of the percent of the students choosing volleyball?

Students' Choices for Gym



A. 10%

B. 30%

✔ C. 20%

D. 80%

Reporting Category/Substrand for Item 28: ***Number Sense*/Mathematical Structure (p. 171)**

29. An article is on sale for 20% off its original price. What percent of increase is needed to return the sale item to its original price?

A. 50%

✔ B. 25%

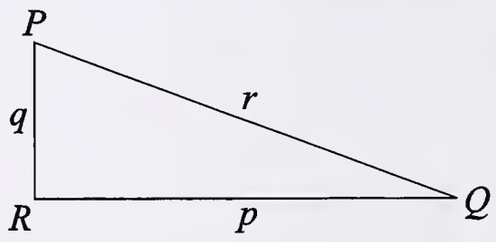
C. 20%

D. 75%

Reporting Category/Substrand for Item 29: ***Number Sense*/Mathematical Structure (p. 171)**

Use the triangle to answer question 30.

30. Triangle PQR is a scalene right triangle. Which of the following is correct?



A. $\cos P = \frac{r}{p}$

B. $\sin Q = \frac{q}{p}$

C. $\cos P = \frac{p}{r}$

✔ D. $\tan Q = \frac{q}{p}$

Reporting Category/Substrand for Item 30: ***Patterns, Relations, and Functions*/Trigonometry (p. 172)**

31. The same six students rated two science fiction movies on a scale of 1 to 10.
The results are shown in the table on the right.

STUDENT	MOVIE 1 RATING	MOVIE 2 RATING
A	3	6
B	5	7
C	6	6
D	7	6
E	8	5
F	8	7

The ratings for the two movies have the same

A. median.

✔ B. mean.

C. mode.

D. range.

Reporting Category/Substrand for Item 31: ***Statistics and Probability*/Statistics (p. 174)**

32. If 4 notebooks and 3 packages of pens cost $7.43 and 5 notebooks and 2 packages of pens cost $7.03, what is the cost of 1 notebook?

✔ A. $0.89

B. $0.79

C. $1.29

D. $1.09

Reporting Category/Substrand for Item 32: ***Patterns, Relations, and Functions*/Algebra (p. 172)**

33. According to the 1990 U.S. Census, 27.2% of Massachusetts residents over the age of 25 had graduated from a 4-year college. In a circle graph representing all Massachusetts residents over the age of 25, about how many degrees should be in the sector representing these 4-year college graduates?

A. 27°

B. 17°

✔ C. 98°

D. 68°

Reporting Category/Substrand for Item 33: ***Statistics and Probability*/Statistics (p. 174)**

34. In Jackson High School, 28% of all students play a musical instrument, and 75% of those students are in the marching band. What percent of all students in the school are in the marching band?

A. 103%

✔ B. 21%

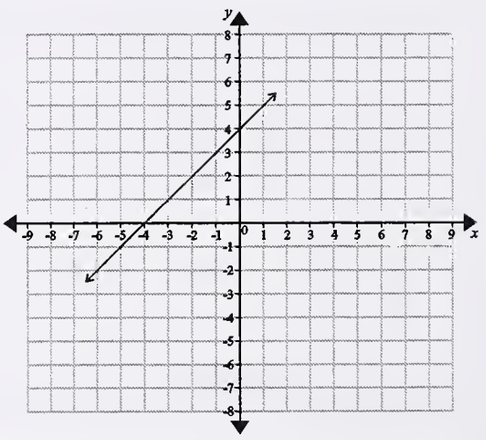
C. 47%

D. 3%

Reporting Category/Substrand for Item 34: ***Statistics and Probability*/Statistics (p. 174)**

Use the graph to answer question 35.

35. Which of the following equations is represented by the graph on the right?



A. $y - x = -4$

B. $x + y = 4$

✔ C. $y - x = 4$

D. $x + y = -4$

Reporting Category/Substrand for Item 35: ***Patterns, Relations, and Functions*/Algebra (p. 172)**

Use the information in the box below to answer question 36.

36. Misha and his sister are using 5-foot and 8-foot landscaping timbers to enclose a vegetable garden. They bought 40 timbers. The total cost for the timbers was $288. Which pair of equations could be used to find the number of timbers of each size that they bought?

A. $6x + 9y = 40$ and $x + y = 288$

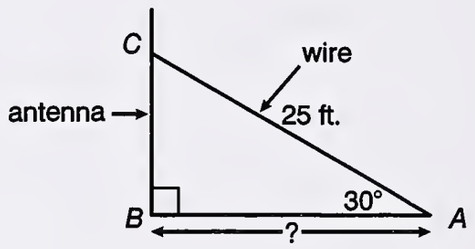
B. $x + y = 40$ and $5x + 8y = 288$

C. $5x + 8y = 40$ and $6x + 9y = 288$

✔ D. $x + y = 40$ and $6x + 9y = 288$

Reporting Category/Substrand for Item 36: ***Patterns, Relations, and Functions*/Algebra (p. 172)**

37. A 25-foot wire attached to an antenna makes a 30° angle with the level ground, as shown on the right.



What is the approximate distance from the base of the antenna to the place where the wire is staked to the ground?

✔ A. 22 ft.

B. 18 ft.

C. 13 ft.

D. 28 ft.

Reporting Category/Substrand for Item 37: ***Geometry and Measurement*/Geometry and Spatial Sense (p. 173)**

38. Six candidates are running for two open school board seats. How many different pairs of candidates can be elected?

✔ A. 15

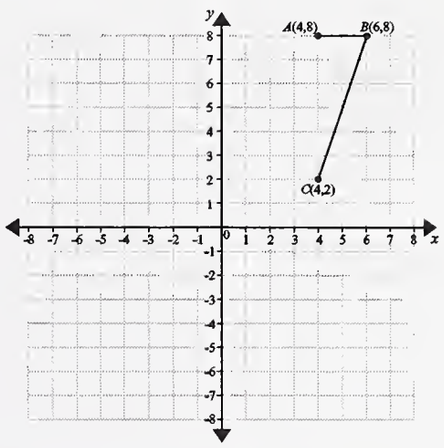
B. 12

C. 11

D. 30

Reporting Category/Substrand for Item 38: ***Statistics and Probability*/Probability (p. 174)**

Use the diagram to answer question 39.



39. Suppose that the figure *ABC* is reflected over the *y*-axis. What are the coordinates of the image of point *A*?

    A. (4,–8)

✔ B. (–4,8)

    C. (–8,4)

    D. (8,–4)

Reporting Category/Substrand for Item 39: ***Geometry and Measurement*/Geometry from an Algebraic Perspective (p. 173)**

40. Triangles *ABC* and *DEF* are similar. The lengths of the sides of Δ*DEF* are 3 times the lengths of the corresponding sides of Δ*ABC*. How do the areas of the triangles compare?

    A. The area of Δ*DEF* is 3 times the area of Δ*ABC*.

    B. The area of Δ*DEF* is 4 times the area of Δ*ABC*.

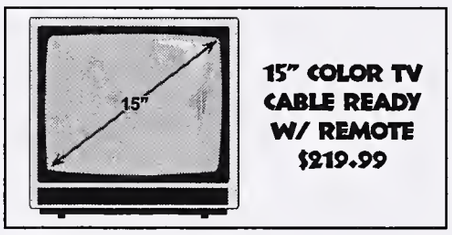
    C. The area of Δ*DEF* is 6 times the area of Δ*ABC*.

✔ D. The area of Δ*DEF* is 9 times the area of Δ*ABC*.

Reporting Category/Substrand for Item 40: ***Geometry and Measurement*/Geometry and Spatial Sense (p. 173)**

Session 3, Open-Response Questions

Use the graphic to answer question 41.



41. The size of a television screen is measured by the diagonal distance across the screen.

    a. A 15" diagonal screen has a horizontal width of 12". What is the vertical height of the screen? Show or explain how you found your answer.

    b. A 50" diagonal screen is to have its dimensions proportional to those of the screen in part a. What are its width and height? Show or explain how you found your answers.

    c. Suppose that the ratio of a television's width to its height was 3 to 2. What would be the dimensions of a 17" diagonal screen? Show or explain how you found your answer.

Reporting Category/Substrand for Item 41: ***Geometry and Measurement*/Geometry and Spatial Sense (p. 173)**

42. The Main Street Cinema is planning to add a coffee bar. The owners estimate that the fixed monthly expenses will be $2,700. Additionally, each cup of coffee will cost $0.25 to make and will be sold for $0.95. The owners estimate that they will sell 3,000 cups of coffee each month.

    a. What would be their monthly profit or loss on selling coffee? Explain or show how you found your answer.

    b. What price per cup would they have to charge to break even (neither a profit nor a loss)? Explain or show how you found your answer.

    c. The owners need a formula to calculate monthly profit or loss. Using the variables listed below, write a formula to determine their monthly profit or loss.

    - Fixed monthly expenses: F
    - Cost to make each cup: C
    - Selling price of each cup: S
    - Number of cups sold in a month: N
    - Monthly profit or loss: P

Reporting Category/Substrand for Item 42: ***Patterns, Relations, and Functions*/Algebra (p. 172)**

VIII. Science & Technology,

Grade 4

Science & Technology, Grade 4

The spring 2000 MCAS Science & Technology test was based on the learning standards of the Massachusetts *Science & Technology Curriculum Framework* (1996). The *Framework* defines four content strands, with three major divisions within the *Domains of Science* strand:

- *Inquiry*
- *Domains of Science*
  - *Physical Sciences*
  - *Life Sciences*
  - *Earth and Space Sciences*
- *Technology*
- *Science, Technology, and Human Affairs*

The MCAS publication, *Guide to the Massachusetts Comprehensive Assessment System: Science & Technology,* further divides these strands (except for *Science, Technology, and Human Affairs*) into multiple subcategories for each grade. These MCAS subcategories are specifically referenced in the MCAS document, *Guide to Interpreting the 2000 MCAS Reports for Schools and Districts,* due for release later in 2000.

Curriculum Framework *Learning Standards*

Learning standards are grouped below by *Framework* content strand and related MCAS subcategory.[16] Applicable *Framework* page numbers are given in parentheses following each heading.

[16] A very small percentage—less than 1%—of *Science & Technology Curriculum Framework* learning standards that are impractical to test in a large-scale assessment are not tested by MCAS (e.g., at grade 10: "use a range of exploratory techniques, e.g., experiments, information/literature searches, data logging, research and development"). These learning standards are not included in this document.

Inquiry

Classification (*Framework*, p. 27)

Students engage in problem solving, evaluating evidence, searching for connections, and the process of inquiry, in order to

- observe and describe familiar objects and events, identifying details, similarities, and differences.

Designing an Investigation (*Framework*, p. 27)

Students engage in problem solving, evaluating evidence, searching for connections, and the process of inquiry, in order to

- ask questions, both investigable and non-investigable, about the objects and events observed. Suggest ideas about, "how," "why," and "what would happen if?"
- make predictions based on past experience with a particular material or object.
- plan and conduct a simple investigation knowing what is to be compared or looked for.

Data Collection, Measurement, and Display (*Framework*, p. 27)

Students engage in problem solving, evaluating evidence, searching for connections, and the process of inquiry, in order to

- extend observations using simple tools, e.g., hand lens, rulers, two-arm balance.
- describe and communicate observations through discussions, drawings, simple graphs, and writing.

Analysis and Interpretation of Data (*Framework*, p. 27)

Students engage in problem solving, evaluating evidence, searching for connections, and the process of inquiry, in order to

- recognize and communicate simple patterns in data.
- describe ideas about "how," "why," and "what would happen if?"
- interpret findings by relating one factor to another, e.g., If a ball is dropped from a higher place, will it always bounce higher?

Domains of Science: Physical Sciences

Properties of Matter (*Framework*, p. 44)

Students engage in problem solving, evaluating evidence, searching for connections, and the process of inquiry, in order to

- identify the observable properties of objects such as size, weight, shape, and color.
- give evidence that objects are made up of different materials. Show that properties are useful in describing, grouping, and classifying materials.

- represent an understanding that materials can exist in different states, including solid, liquid, and gaseous, and identify different characteristic properties of materials in each state.

- show and describe how change in a material may be either physical, such as changes in state or appearance, or chemical, such as changes in composition.

Position and Motion of Objects (*Framework,* p. 44)

Students engage in problem solving, evaluating evidence, searching for connections, and the process of inquiry, in order to

- describe the motion of an object in terms of change in position relative to another object or the background.

- experience and describe how an object's motion can be changed through the action of a push or pull on the object.

- demonstrate that sound is produced by vibrating objects.

Energy (*Framework,* p. 45)

Students engage in problem solving, evaluating evidence, searching for connections, and the process of inquiry, in order to

- represent an understanding that the sun supplies heat and light to the Earth.

- manipulate a variety of objects in a beam of light in order to explore conditions in which different objects cast shadows, bend, or transmit light.

- demonstrate that things that give off light may also give off heat.

- investigate situations in which changes in matter also give off energy as light, heat, or sound.

- use qualitative or quantitative measurement to investigate the concept that warmer things put with cooler ones lose heat and the cool ones gain heat, until they are all at the same temperature.

- explore and describe how heat travels more quickly through some materials than others.

- provide evidence that a magnet pulls on all things made of iron and either pushes or pulls on other magnets.

- demonstrate how materials that have been electrically charged may either push or pull other charged materials.

- investigate and describe how light, sound, heat, and sparks can be produced in electrical circuits using batteries as an energy source.

Domains of Science: Life Sciences

Characteristics of Organisms (*Framework,* p. 59)

Students engage in problem solving, evaluating evidence, searching for connections, and the process of inquiry, in order to

- explore and describe that plants and animals are living things and have characteristics that differentiate them from non-living things.
- demonstrate an understanding that plants and animals go through predictable life cycles. These differ from species to species, but all include growth, development, reproduction, and death.
- observe and describe that plants and animals have different structures that serve different functions in growth, survival, and reproduction. These contribute to the well-being of the whole organism, and to the success of its offspring.
- demonstrate awareness that there are millions of kinds of living things on Earth, and that the number of species is not known.

Adaptations, Diversity, and Heredity (*Framework,* pp. 59–60)

Students engage in problem solving, evaluating evidence, searching for connections, and the process of inquiry, in order to

- give examples of how different plants and animals have features that help them thrive in different kinds of places. Recognize that these features may be external or internal (such as warm- or cold-bloodedness), or behavioral.
- identify some kinds of organisms that once lived on earth and that have completely disappeared.
- observe and illustrate ways that individuals of the same kind differ in some of their characteristics, and that sometimes the differences give individuals an advantage in surviving and reproducing.
- compare fossils to one another and to living organisms according to their similarities and differences.
- provide examples of variations as well as similarities among individuals of the same species. Recognize that although it is hard for us to see this, it is true of all kinds of organisms.
- observe and describe that some of the variations within a species are acquired during the individual's lifetime (such as an athlete's muscles, or the ability to play the piano); some were inherited from the individual's parents (such as eye color); some start with inherited tendencies, which develop in individual ways owing to the conditions of the individual's life (such as height and foot-size).

- identify ways that offspring resemble their parents, but are not identical to them. Realize that, in every group of organisms, there is variation in every characteristic.

Organisms and Environments (*Framework,* p. 60)

Students engage in problem solving, evaluating evidence, searching for connections, and the process of inquiry, in order to

- provide evidence that all organisms use some basic chemical building blocks, including water and oxygen. Observe that each kind of organism has special living requirements, and each has its own way to get the energy and nutrients it needs. Observe that green plants can make their own food from sunlight; animals consume plants or other organisms for their food.

- explore and illustrate an understanding that decomposers, which include single-celled organisms and fungi, break down dead plants and animals for food.

- provide examples of living organisms meeting their needs by interacting with living and non-living parts of the environment in which they live.

- observe and demonstrate ways that all organisms effect change in the environment where they live. Recognize that some of these changes are detrimental to themselves and other organisms, whereas others are beneficial. Observe ways that changes in environmental factors, such as humidity, temperature, and light, also affect the organisms in an environment.

Domains of Science: Earth and Space Sciences

Properties of Earth's Materials (*Framework,* p. 74)

Students engage in problem solving, evaluating evidence, searching for connections, and the process of inquiry, in order to

- illustrate that Earth's surface is composed of water, rocks, soils, and living organisms.

- observe and describe that change is something that happens to Earth materials.

- illustrate that some events in nature have a repeating pattern. The weather changes some from day to day, but things such as temperature and precipitation show annual rhythms particular to a geographical area.

- observe and show that air has properties that can be identified and measured, such as wind speed and direction, temperature, moisture, the occurrence of clouds, and the fall of precipitation. Know that together these properties and events for a particular place and time is called the weather.

- explore and demonstrate that rocks are made of minerals.

(continued on next page)

- observe and illustrate that rocks come in many sizes and shapes, from boulders to grains of sand and even smaller.
- show evidence that water flows downhill in streams and rivers, or accumulates in lakes and puddles and seeps into the ground.
- examine and describe ways in which fossils provide evidence of Earth's history, and show how plants, animals, and environments have changed over time.
- illustrate that the interior of Earth is hot. Heat flow and movement of material within the Earth move continents, cause earthquakes and volcanic eruptions, and create mountains and ocean basins.

Objects in the Sky (*Framework,* p. 75)

Students engage in problem solving, evaluating evidence, searching for connections, and the process of inquiry, in order to

- examine and illustrate that Earth is one of several planets that orbit the sun, and that the moon orbits around the Earth.
- describe ways in which the sun, moon, planets, meteors, clouds and other objects in the sky can be identified by properties such as size, shape, color, brightness, and movement.
- represent understanding that the sun provides light and heat.
- observe and explain why the sun can be seen only in the daytime, but the moon can be seen sometimes at night and sometimes during the day. Know that because Earth rotates, the sun, moon, and stars all appear to move slowly across the sky.
- observe and illustrate why the moon looks a little different every day, but looks the same again about every four weeks.

Technology

The Design Process (*Framework,* p. 88)

Students engage in problem solving, evaluating evidence, searching for connections, and the process of inquiry, in order to

- identify a simple current technological problem.
- implement a solution by constructing a device using materials provided.
- evaluate a solution in terms of whether it meets the goals.
- communicate a problem, design, or solution using drawings and words.
- propose ways to improve the solution.

Understanding and Using Technology (*Framework*, pp. 90–91)

Students engage in problem solving, evaluating evidence, searching for connections, and the process of inquiry, in order to

- describe ways in which tools and machines are used to process materials, energy, and information.
- demonstrate use and care of simple tools.
- document that people are always inventing new ways to get things done.
- use a variety of materials such as wood, metal, plastic, fabric, and clay to make simple products.
- identify materials that can be recycled and those that cannot.
- explain that messages are communicated using tools such as pencils and computers.
- observe and model many types of structures, e.g., residences, skyscrapers, bridges, tunnels, airports.
- describe and experience how objects can be made from materials such as wood, plastic, paper, metal, and clay by processes often involving machines.
- describe how people and goods are transported using boats, automobiles, trucks, airplanes, and space vehicles.
- describe differences between natural objects and objects made by people.
- identify daily activities that involve the use of technology, e.g., communication, transportation.
- describe ways in which technological tools and methods allow us to better learn about the laws of nature.
- document how technological inventions and innovations have been developed by women and men from various racial and cultural backgrounds, including individuals from Massachusetts.
- examine evidence that where people live, and how they communicate, and how they travel reflect technological changes.

Science, Technology, and Human Affairs

Science, Technology, and Human Affairs (*Framework,* pp. 90 and 110)

Students engage in problem solving, evaluating evidence, searching for connections, and the process of inquiry, in order to

- describe how technologies may have positive and negative impacts on people and the environment.[17]
- give examples to show that many of today's technologies were not part of the world of their parents or grandparents.
- describe some ways in which science and technology have changed the way people do their work and live their lives.
- give examples to show that the decisions we make as individuals have effects on other people.
- explore and describe how science and technology have also created problems we need to solve.
- give examples to show that we (as individuals, groups, and communities) can make decisions that change the natural environment.

MCAS Reporting Categories

In *Test Item Analysis Reports* and on the *Subject Area Subscore* pages of the MCAS *School* and *District Reports,* Science & Technology test results are reported under the following five MCAS reporting categories:

- Inquiry
- Physical Sciences
- Life Sciences
- Earth and Space Sciences
- Technology

[17] This learning standard derives from the *Technology* strand of the *Framework.*

MCAS Spring 2000 Common Test Items
Science & Technology, Grade 4

Test Sessions

MCAS grade 4 Science & Technology Student Test Booklets included 2 separate test sessions. Each session included multiple-choice and open-response questions.

Reference Materials and Tools

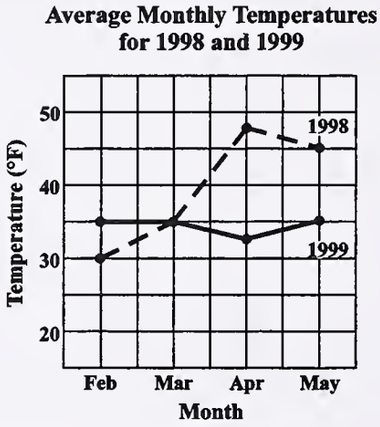
No reference tools or materials were allowed during any Science & Technology test session.

Cross-Reference Information

The shaded bar underneath each item indicates the item's MCAS reporting category and the MCAS subcategory that contains the *Framework* learning standard(s) assessed by the item. The parentheses indicate the page(s) in this document where the learning standard(s) may be found.

Session 1, Multiple-Choice Questions

1. The graph below shows the average temperatures for four months in 1998, and the average temperatures for the same city for the same months in 1999.



During which month were the average temperatures for 1998 and 1999 the farthest apart?

A. February

B. March

✔ C. April

D. May

Reporting Category/Subcategory for Item 1: ***Inquiry*/Analysis and Interpretation of Data (p. 200)**

2. Which environmental problem was directly caused by the invention of the automobile?

A. storage of nuclear waste

✔ B. increase in air pollution

C. increased use of pesticides

D. flooding in the Midwest

Reporting Category/Subcategory for Item 2: ***Technology*/Science, Technology, and Human Affairs (p. 206)**

3. The BEST way to tell the DIFFERENCE between an oak and a maple tree is to compare the

   A. height of both trees.

   B. number of leaves on the trees.

   C. size of the root systems of the trees.

✔ D. shape of the leaves.

Reporting Category/Subcategory for Item 3: ***Life Sciences*/Characteristics of Organisms (p. 202)**

4. Why are the rocks and pebbles found on riverbeds usually smooth?

   A. The rocks and pebbles in riverbeds are not very old.

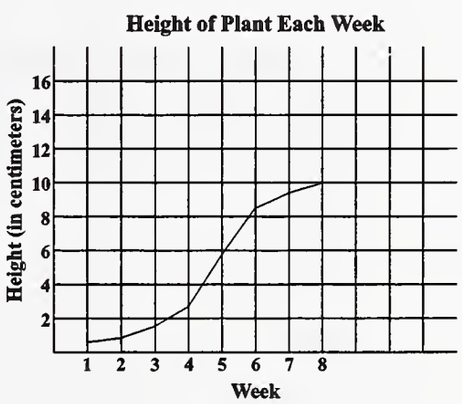
✔ B. The rocks and pebbles rub against each other as water flows over them.

   C. Rivers can only flow over smooth rocks and pebbles.

   D. Organisms in the rivers break down the rocks and pebbles.

Reporting Category/Subcategory for Item 4: ***Earth and Space Sciences*/Properties of Earth's Materials (pp. 203-204)**

5. For his school project, Greg measured the height of a plant over an 8-week period. The graph of his results is shown on the right.



   If the trend continues, which is the BEST prediction of the height of the plant at week 10?

   A. 5 cm

   B. 8 cm

✔ C. 11 cm

   D. 20 cm

Reporting Category/Subcategory for Item 5: ***Inquiry*/Analysis and Interpretation of Data (p. 200)**

6. Which technology was developed most recently?

✔ A. cellular telephone

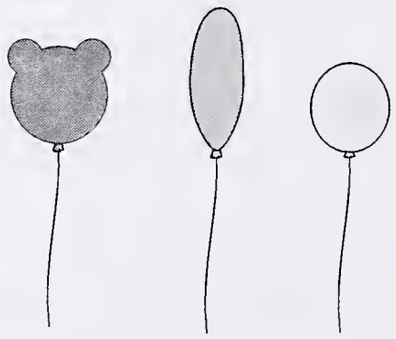
B. television

C. refrigerator

D. airplane

Reporting Category/Subcategory for Item 6: ***Technology*/Science, Technology, and Human Affairs (p. 206)**

7. At a parade, Josh noticed the various balloons shown on the right.



Based on his observation, Josh concluded that

A. all gases release energy.

B. gases form when liquids are heated.

✔ C. gases take the shape of their containers.

D. all gases provide heat.

Reporting Category/Subcategory for Item 7: ***Physical Sciences*/Properties of Matter (pp. 200-201)**

8. Which animals live part of their lives in water and part on land, and go through metamorphosis?

A. reptiles

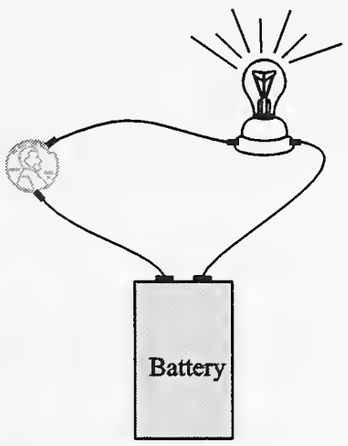
✔ B. amphibians

C. birds

D. mammals

Reporting Category/Subcategory for Item 8: ***Life Sciences*/Characteristics of Organisms (p. 202)**

Use the picture on the right to answer question 9.



9. When both wires are touching the penny, the lightbulb will light. This is because the penny

✔ A. is a good conductor.

B. is made of a hard substance.

C. is not attracted to a magnet.

D. can be melted.

Reporting Category/Subcategory for Item 9: ***Physical Sciences*/Properties of Matter (pp. 200-201)**

10. Irene needs to join two boards together. Which would NOT be used to join the boards together?

A. glue

B. screws

C. nails

✔ D. saw

Reporting Category/Subcategory for Item 10: ***Technology*/Understanding and Using Technology (p. 205)**

11. A rosebush and a bird are similar because they both

✔ A. are living organisms.

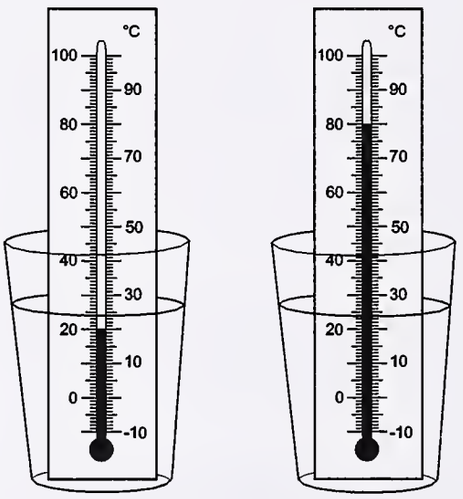
B. need to search for food.

C. make their own food.

D. are non-living organisms.

Reporting Category/Subcategory for Item 11: ***Life Sciences*/Characteristics of Organisms (p. 202)**

Use the pictures on the right to answer question 12.



Picture A

Picture B
(same glass,
10 minutes later)

12. Which might have happened to the glass in Picture A to cause the temperature to change as shown in Picture B?

A. The glass was placed in the refrigerator for 10 minutes.

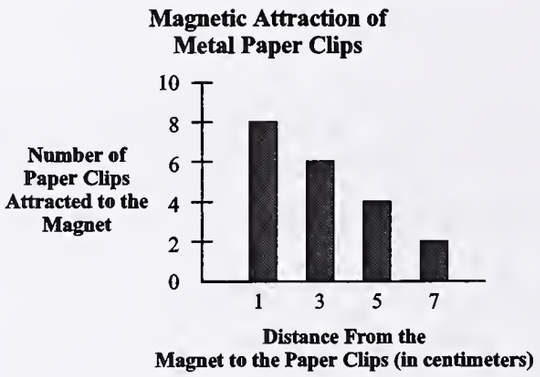
B. Cold water was added to the glass.

C. The glass was taken from a sunny place and put in a shady place.

✔ D. The glass was placed in warm water.

Reporting Category/Subcategory for Item 12: ***Physical Sciences*/Energy (p. 201)**

Use the graph to answer question 13.



13. Which conclusion can be reached by reading this graph?

A. Every time you move metal paper clips 2 cm from the magnet, 2 more metal paper clips are attracted to it.

✔ B. The closer the magnet is to the metal paper clips, the more metal paper clips will be attracted to it.

C. More metal paper clips are attracted to the magnet at 3 cm than at 1 cm.

D. Magnets should be kept 1 cm from metal paper clips.

Reporting Category/Subcategory for Item 13: ***Inquiry*/Analysis and Interpretation of Data (p. 200)**

14. Earth's rotation (turning on its axis) causes

    A. the seasons to change.

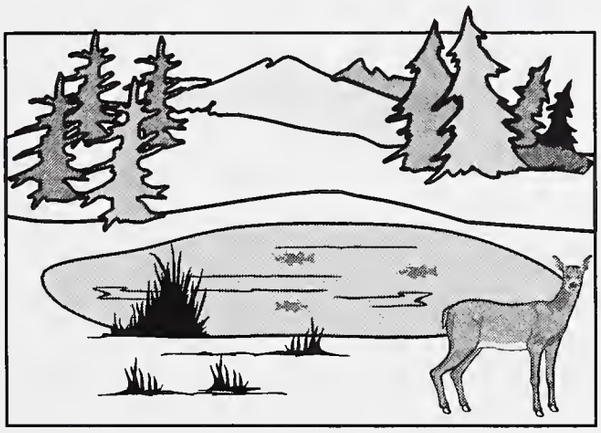
    B. the Moon to appear as different shapes.

✔ C. day and night.

    D. solar eclipses.

Reporting Category/Subcategory for Item 14: ***Earth and Space Sciences*/Objects in the Sky (p. 204)**

15. If the Sun's light no longer reached the habitat pictured below, which would probably happen FIRST?



✔ A. Grass would die.

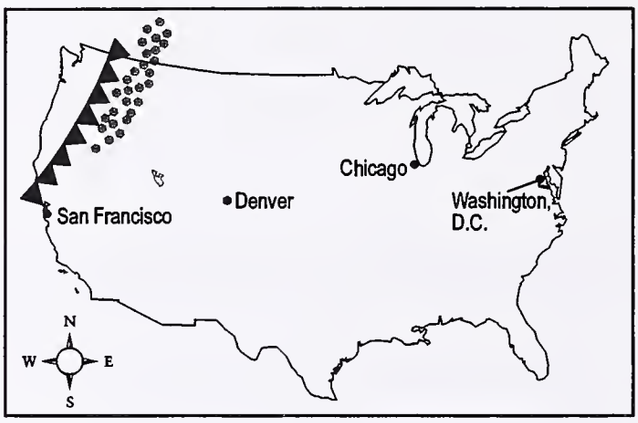
    B. The lake would dry up.

    C. The number of fish in the lake would increase.

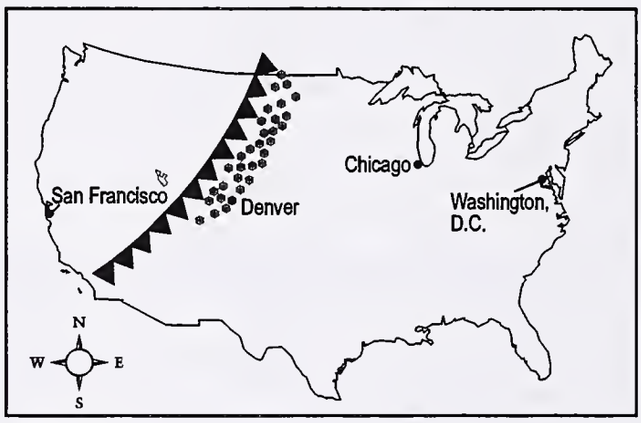
    D. Large animals would grow even larger.

Reporting Category/Subcategory for Item 15: ***Life Sciences*/Organisms and Environments (p. 203)**

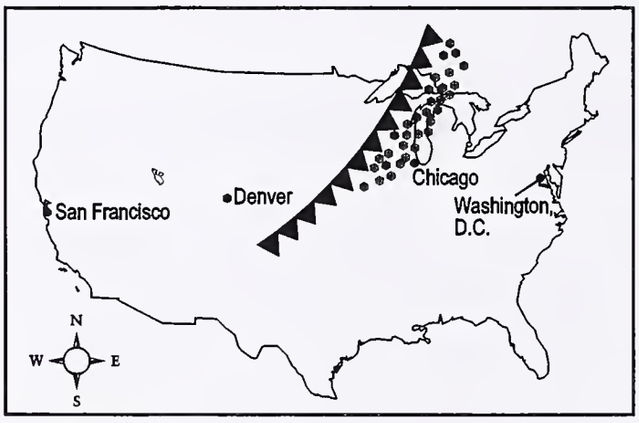
16. The maps below show the weather predictions for March 6, 8, and 10.



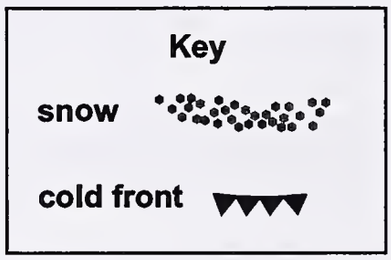
March 6



March 8



March 10



When will this cold front MOST LIKELY reach Washington, D.C.?

A. March 8

B. March 10

✔ C. March 12

D. March 17

Reporting Category/Subcategory for Item 16: ***Inquiry*/Analysis and Interpretation of Data (p. 200)**

17. Which is an example of a human-made product?

✔ A. cake

B. tomato

C. wheat

D. coal

Reporting Category/Subcategory for Item 17: ***Technology*/Understanding and Using Technology (p. 205)**

Session 1, Open-Response Questions

18. Raymond and Anne did an experiment and recorded the following observations.

- When they dropped a ball from a height of 2 feet, the ball bounced 1 foot high.
- When they dropped the same ball from a height of 3 feet, the ball bounced $1\frac{1}{2}$ feet high.
- When they dropped the same ball from a height of 5 feet, the ball bounced $2\frac{1}{2}$ feet high.

Here is a chart of their results.

Height Dropped (ft)	Height Bounced (ft)
2	1
3	$1\frac{1}{2}$
5	$2\frac{1}{2}$

a. Draw a graph of their results. Be sure to LABEL the axes.

b. How high do you think the same ball will bounce when Raymond and Anne drop it from a height of 6 feet? Explain how you found your answer.

Reporting Category/Subcategory for Item 18: ***Inquiry*/Analysis and Interpretation of Data (p. 200)**

19. Some organisms (plants and animals) on Earth have become extinct or nearly extinct.

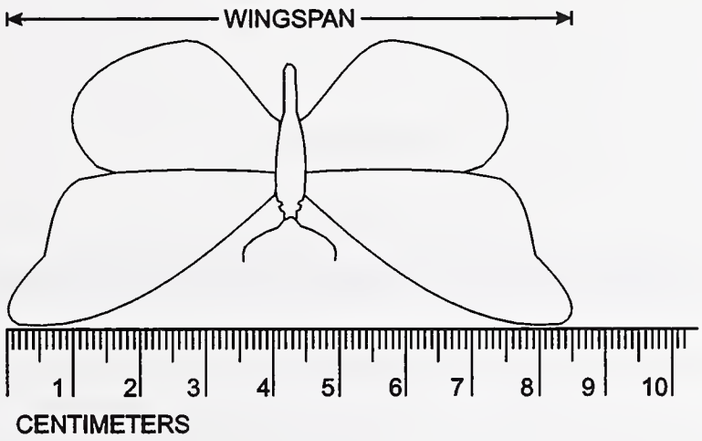
a. Name TWO organisms that have become extinct or nearly extinct.

b. What are some changes in the environment that might have caused each organism you named to become extinct or nearly extinct?

Reporting Category/Subcategory for Item 19: ***Life Sciences*/Adaptations, Diversity, and Heredity (pp. 202-203)**

Session 2, Multiple-Choice Questions

Use the picture below to answer question 20.



20. The width of the wingspan of this butterfly is CLOSEST to

    A. 4.0 cm.

    B. 4.5 cm.

    C. 8.0 cm.

✔ D. 8.5 cm.

Reporting Category/Subcategory for Item 20: ***Inquiry*/Data Collection, Measurement, and Display (p. 200)**

21. If your hands are cold, you can warm them by rubbing them together. The heat energy that you produce is caused by

    A. insulation.

    B. magnetism.

✔ C. friction.

    D. conduction.

Reporting Category/Subcategory for Item 21: ***Physical Sciences*/Energy (p. 201)**

22. An example of an instinct is

A. laughing at something funny.

B. dogs doing tricks when told.

C. doing your homework at the same time each day.

✔ D. salmon returning to their birthplace to lay their eggs.

Reporting Category/Subcategory for Item 22: ***Life Sciences*/Adaptations, Diversity, and Heredity (pp. 202-203)**

23. Cactus plants grow best in environments (habitats) that are

✔ A. hot and dry.

B. hot and wet.

C. cold and dry.

D. cold and wet.

Reporting Category/Subcategory for Item 23: ***Life Sciences*/Adaptations, Diversity, and Heredity (pp. 202-203)**

24. Why do identical twins usually look like each other?

A. They were born on the same day.

B. They have the same kinds of interests.

✔ C. They inherited the same characteristics from their parents.

D. They were taught the same kinds of things at home.

Reporting Category/Subcategory for Item 24: ***Life Sciences*/Adaptations, Diversity, and Heredity (pp. 202-203)**

25. Robots are used to help manufacture cars. One problem with this is

A. less waste.

B. lower cost.

✔ C. fewer jobs.

D. more mistakes.

Reporting Category/Subcategory for Item 25: ***Technology*/Science, Technology, and Human Affairs (p. 206)**

26. The Moon revolves around Earth. This causes

    A. Earth to be warmer at night.

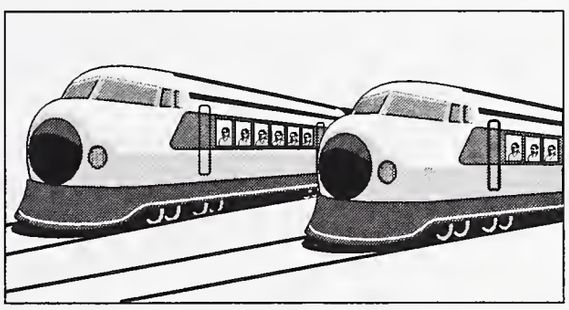
    B. Earth to rotate more rapidly.

    C. the Moon to shine more brightly than other objects in the sky.

✔ D. the Moon to appear as different shapes during the month.

Reporting Category/Subcategory for Item 26: ***Earth and Space Sciences*/Objects in the Sky (p. 204)**

27. Monique is taking a train to Boston. Her train is stopped at the station. She is facing the direction the train will be moving. All she can see from her window is the train next to her. That train is also going to Boston and leaves first. As the other train leaves, it seems to Monique as if



    A. she is moving forward.

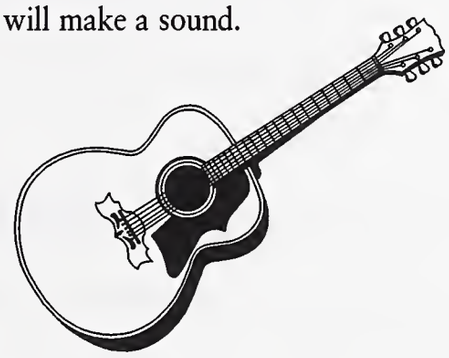
✔ B. she is moving backward.

    C. the other train is moving backward.

    D. the train station is moving.

Reporting Category/Subcategory for Item 27: ***Physical Sciences*/Position and Motion of Objects (p. 201)**

28. If a string on a guitar is plucked (pulled back and released), it will make a sound. A sound is produced because the string is



    A. expanding.

✔ B. vibrating.

    C. becoming warmer.

    D. shrinking.

Reporting Category/Subcategory for Item 28: ***Physical Sciences*/Position and Motion of Objects (p. 201)**

29. When white, fluffy clouds appear in Massachusetts, the weather that day will MOST LIKELY be

✔ A. fair.

B. stormy.

C. foggy.

D. rainy.

Reporting Category/Subcategory for Item 29: ***Earth and Space Sciences*/Properties of Earth's Materials (pp. 203-204)**

30. Ravi, who lives in Stow, Massachusetts, wants to send a message to his friend in India. Which tool would be the LEAST helpful in sending this message?

A. pencil

B. computer

C. telephone

✔ D. AM/FM radio

Reporting Category/Subcategory for Item 30: ***Technology*/Understanding and Using Technology (p. 205)**

31. A student is investigating solar energy by cooking food in an oven powered by the Sun. On which of the following days will the food cook most quickly?

A. a warm, rainy day

✔ B. a warm, sunny day

C. a warm, cloudy day

D. a hot, cloudy day

Reporting Category/Subcategory for Item 31: ***Earth and Space Sciences*/Objects in the Sky (p. 204)**

32. The parts of plants that make seeds are the

A. roots.

B. stems.

✔ C. flowers.

D. leaves.

Reporting Category/Subcategory for Item 32: ***Life Sciences*/Characteristics of Organisms (p. 202)**

Use the information below to answer question 33.

When students from the local school helped clean the city park, they found a lot of litter floating on top of a pond. They wondered if more litter had sunk below the surface of the water. Back in the classroom, they conducted an experiment to see how long different types of litter would float. They ran three trials. The average floating time is recorded in the chart.

Object	Average Floating Time in Seconds					
	0-4	5-9	10-14	15-19	20-24	More than 24
Plastic bottle cap						X
Flat piece of foil, 2"x 3"				X		
Cloth rag, 12"x 12"		X				
Peach pit	X					
Plastic sandwich bag (open)					X	

33. Based on the chart, which floated for the LEAST amount of time?

A. piece of foil

B. bottle cap

✔ C. peach pit

D. cloth rag

Reporting Category/Subcategory for Item 33: ***Inquiry*/Analysis and Interpretation of Data (p. 200)**

34. A wind farm contains a large number of windmills to generate electricity. Which is the BEST reason wind farms are not located near forests?

✔ A. The trees would reduce the force of the wind.

B. The windmills would destroy the forests.

C. The electricity generated would be too far away from cities to be useful.

D. Forest animals would destroy the windmills.

Reporting Category/Subcategory for Item 34: ***Inquiry*/Designing an Investigation (p. 200)**

35. In the United States, each day the Sun appears to

A. rise in the west and set in the east.

✔ B. rise in the east and set in the west.

C. rise in the north and set in the south.

D. rise in the south and set in the north.

Reporting Category/Subcategory for Item 35: ***Earth and Space Sciences*/Objects in the Sky (p. 204)**

36. Which is NOT a pathway for transportation?

✔ A. radio tower

B. road

C. runway

D. pipeline

Reporting Category/Subcategory for Item 36: ***Technology*/Understanding and Using Technology (p. 205)**

Session 2, Open-Response Questions

37. Maria made the following observations when playing with balloons. For each observation, explain what happened.

    a. After Maria rubbed a balloon on her hair, she found that the balloon could stick to the wall. Explain why the balloon stuck to the wall.

    b. When Maria rubbed a second balloon on her hair and placed it near the first balloon, the two balloons moved apart. Explain why the balloons moved apart.

Reporting Category/Subcategory for Item 37: ***Physical Sciences*/Energy (p. 201)**

38. a. Identify TWO ways that the Moon is different from Earth. Be sure to explain how they are different.

    b. Identify TWO ways that the Moon is similar to Earth. Be sure to explain how they are similar.

Reporting Category/Subcategory for Item 38: ***Earth and Space Sciences*/Objects in the Sky (p. 204)**

39. Your community wants to build an airport.

    a. Explain TWO positive ways an airport would affect your community.

    b. Explain TWO negative ways an airport would affect your community.

Reporting Category/Subcategory for Item 39: ***Technology*/Science, Technology, and Human Affairs (p. 206)**

IX. Science & Technology,

Grade 8

Science & Technology, Grade 8

The spring 2000 MCAS Science & Technology test was based on the learning standards of the Massachusetts *Science & Technology Curriculum Framework* (1996). The *Framework* defines four content strands, with three major divisions within the *Domains of Science* strand:

- *Inquiry*
- *Domains of Science*
  - *Physical Sciences*
  - *Life Sciences*
  - *Earth and Space Sciences*
- *Technology*
- *Science, Technology, and Human Affairs*

The MCAS publication, *Guide to the Massachusetts Comprehensive Assessment System: Science & Technology,* further divides these strands (except for *Science, Technology, and Human Affairs*) into multiple subcategories for each grade. These MCAS subcategories are specifically referenced in the MCAS document, *Guide to Interpreting the 2000 MCAS Reports for Schools and Districts,* due for release later in 2000.

Curriculum Framework *Learning Standards*

Learning standards are grouped below by *Framework* content strand and related MCAS subcategory.[18] Applicable *Framework* page numbers are given in parentheses following each heading.

[18] A very small percentage—less than 1%—of *Science & Technology Curriculum Framework* learning standards that are impractical to test in a large-scale assessment are not tested by MCAS (e.g., at grade 10: "use a range of exploratory techniques, e.g., experiments, information/literature searches, data logging, research and development"). These learning standards are not included in this document.

Inquiry

Designing an Investigation (*Framework,* p. 28)

Students engage in problem solving, evaluating evidence, searching for connections, and the process of inquiry, in order to

- note and describe relevant details, patterns, and relationships.
- differentiate between questions that can be answered through direct investigation and those that cannot.
- apply personal experience and knowledge to make predictions.
- apply multiple lines of inquiry to address and analyze a question, e.g., experimentation, trial and error, survey, interview, and secondary sources.
- design an investigation or problem specifying variables to be changed, controlled, and measured.
- analyze alternative explanations and procedures.
- communicate ideas and questions generated, and suggest improvements or alternatives to the experimental techniques used.

Data Collection, Measurement, and Display (*Framework,* p. 28)

Students engage in problem solving, evaluating evidence, searching for connections, and the process of inquiry, in order to

- use more complex tools to make observations, and gather and represent quantitative data, e.g., microscopes, graduated cylinders, computer probes, stress and impact testers, wind tunnels, and timers.
- represent data and findings using tables, models, demonstrations and graphs.

Analysis and Interpretation of Data (*Framework,* p. 28)

Students engage in problem solving, evaluating evidence, searching for connections, and the process of inquiry, in order to

- describe trends in data even when patterns are not exact.
- reformulate ideas and technological solutions based on evidence.[19]
- communicate the idea that usually there is more than one solution to a technological problem.[20]
- design a solution involving a technological problem and describe its advantages and disadvantages.[21]

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[19] Related learning standards can be found in the grade 8 subcategory, *The Design Process.*
[20] See note 19.
[21] See note 19.

Domains of Science: Physical Sciences

Properties of Matter (*Framework,* p. 47)

Students engage in problem solving, evaluating evidence, searching for connections, and the process of inquiry, in order to

- identify properties that allow materials to be distinguished from one another and often make them well suited to specific purposes.
- identify and classify elements and compounds with similar properties, such as metals, metalloids, and non-metals; acids and bases; combustibles and non-combustibles.
- present evidence that a chemical change involves the transformation of one or more substances into new substances with different characteristic properties.
- explore and describe that the mass of a closed system is conserved.
- measure and predict changes in the pressure, temperature, or volume of a gas sample when changes occur in either of the other two properties.
- describe a particulate model for matter that accounts for the observed properties of substances.
- recognize and explain how experimental evidence supports the idea that matter can be viewed as composed of very small particles (such as atoms, molecules and ions) that are in constant motion. Illustrate understanding that particles in solids are close together and not moved about easily; particles in liquids are about as close together and move about more easily; and particles in gases are quite far apart and move about freely.
- provide evidence that shows how the conservation of mass is consistent with the particulate model that describes changes in substances as the result of the rearrangement of the component particles.

Motion (*Framework,* p. 48)

Students engage in problem solving, evaluating evidence, searching for connections, and the process of inquiry, in order to

- show and describe how forces acting on objects as pushes or pulls can either reinforce or oppose each other.
- demonstrate that all forces have magnitude and direction; create situations to model how forces acting in the same direction reinforce each other and forces acting in different directions may detract or cancel or nullify each other.
- describe and represent an object's motion graphically in terms of direction, speed, velocity, and/or position versus time; describe these quantities verbally and mathematically.

Energy (*Framework*, p. 48)

Students engage in problem solving, evaluating evidence, searching for connections, and the process of inquiry, in order to

- represent an understanding that energy cannot be created or destroyed but exists in different interchangeable forms, such as light, heat, chemical, electrical, and mechanical.
- present evidence that heat energy moves in predictable ways, flowing from warmer objects to cooler ones until both objects are at the same temperature.
- illustrate an understanding that energy comes to Earth as electromagnetic radiation in a range of wavelengths, such as light, infrared, ultraviolet, microwaves, and radio waves.
- investigate and describe an understanding of visible electromagnetic radiation, which we generally call light, with reference to qualities such as color and brightness. Illustrate understanding that light has direction associated with it, and can be absorbed, scattered, reflected, or transmitted by intervening matter.
- explain ways that energy can be changed from one form to another.
- demonstrate principles of electrical circuits.

Domains of Science: Life Sciences

Characteristics of Organisms (*Framework*, p. 62)

Students engage in problem solving, evaluating evidence, searching for connections, and the process of inquiry, in order to

- identify the cell as the basic unit of life and the smallest unit that can reproduce itself. Give examples of single and multicellular organisms.
- explore and describe an understanding that plants, animals, fungi, and various types of microorganisms are major categories of living organisms. Each category includes many different species. Note that these categories are subject to change. Life does not always fit into neat categories (e.g., are viruses alive?).
- observe and explain that in single cells there are common features that all cells have as well as differences that determine their function.
- investigate and illustrate evidence that cell replication results not only in the multiplication of individual cells, but also in the growth and repair of multicellular organisms.
- present data to illustrate that all organisms, whether single or multicellular, exhibit the same life processes, including growth, reproduction and the exchange of materials and energy with their environments.

- describe ways that cells can differ in multicellular organisms, assuming different appearances and carrying out specialized functions.
- investigate and explain that complex multicellular organisms are interacting systems of cells, tissues, and organs that fulfill life processes through mechanical, electrical, and chemical means, including procuring or manufacturing food, and breathing and respiration.

Diversity, Adaptation, and Reproduction of Organisms (*Framework,* pp. 62–63)

Students engage in problem solving, evaluating evidence, searching for connections, and the process of inquiry, in order to

- explain situations in which short-term changes in available food, moisture, or temperature of an ecosystem may result in a change in the number of organisms in a population or in the average size of individual organisms or in the behavior of individuals in a population.
- explore and illustrate that, in both the short and long term (millions of years), changes in the environment have resulted in qualitative and quantitative changes in the species of plants and animals that inhabit Earth.
- explain the importance of reproduction to the survival of the species.
- investigate and describe processes by which organisms that have two parents receive a full set of genetic instructions by way of the parents' reproduction cells specifying individual traits from each parent. Offspring exhibit traits from each parent.
- illustrate an understanding that sorting and recombining of the genetic material of parents during reproduction produce the potential for variation among offspring.
- examine evidence and describe that there are minor differences among individuals from the same population or among individuals of the same species.

Ecosystems and Organisms (*Framework,* p. 63)

Students engage in problem solving, evaluating evidence, searching for connections, and the process of inquiry, in order to

- present evidence that species depend on one another.
- explore and illustrate how energy is supplied to an ecosystem primarily in the form of sunlight.
- observe and illustrate the variety of ways in which plants, animals, fungi, and microorganisms interact.
- classify organisms according to the function they serve in a food chain (any single organism can serve each of these functions): production of food, consumption of food, or decomposition of organic matter.

Domains of Science: Earth and Space Sciences

Interactions and Cycles in the Earth System/Earth's History (*Framework,* pp.76–77)

Students engage in problem solving, evaluating evidence, searching for connections, and the process of inquiry, in order to

- demonstrate an understanding of the internal and external structure of planet Earth.
- explore and illustrate an understanding that heat flow and movement of material within Earth moves the continents, causes earthquakes and volcanic eruptions, and creates mountains and ocean bases.
- evaluate conditions under which sedimentary, igneous, and metamorphic rocks form.
- identify ways in which soil is formed by the weathering of rock and the decomposition of dead plants and animal debris.
- give evidence that water in the Earth system exists naturally in all three states and water continuously circulates through the Earth's crust, oceans and air (water cycle).
- demonstrate an understanding that, like all planets and stars, Earth is approximately spherical in shape. (also addressed in reporting category "Earth and Space")
- present evidence that Earth's oceans are a reservoir of nutrients, minerals, dissolved gases, and life forms which are the major source of water vapor for the atmosphere and that the store of heat transported by ocean currents greatly affect Earth's climate.
- observe and describe evidence that local climate changes over periods of years or decades, while global climate changes much more slowly.
- examine and demonstrate evidence that weather can be studied in terms of properties of the atmosphere such as pressure, temperature, humidity, wind speed and direction, precipitation, and amount and type of clouds.
- explain that clouds reflect much of the sunlight intercepted by Earth, while at the same time returning to Earth's surface a large fraction of the far infrared energy emitted from the surface.
- examine and demonstrate evidence that the atmosphere and the oceans have a limited capacity to recycle materials naturally.
- explore and describe that rain or snow falls and moves by gravity from higher to lower areas both on the surface and on the ground and that the natural flow region is called the watershed.

- investigate and illustrate ways in which human activities, such as reducing the amount of forest cover, increasing the amount and variety of chemicals released into the atmosphere, and intensive farming, have changed Earth's land, oceans, and atmosphere.

- examine evidence and illustrate that the movement of the continents has had significant effects on the distribution of living things.

- examine and describe ways in which rocks, fossils, ice cores, and tree rings record events of Earth's history, documenting plate movements, volcanic eruptions, cycles of erosion and deposition, and the evolution of life.

Earth and Space (*Framework,* pp. 77–78)

Students engage in problem solving, evaluating evidence, searching for connections, and the process of inquiry, in order to

- observe and demonstrate that the patterns of stars in the sky stay the same, although they appear to move across the sky nightly, and different stars can be seen in different seasons.

- explore and explain that telescopes magnify the appearance of some distant objects in the sky, including the moon and the planets.

- observe and illustrate that planets change their positions against the background of stars.

- recognize and describe that the Solar System contains the central sun, the known planets, their moons, and many asteroids, meteors, and comets that orbit the sun.

- demonstrate evidence that the sun is a medium-sized star located near the edge of a disk-shaped galaxy of stars, part of which can be seen as a glowing band of light that spans the sky on a very clear night.

- illustrate that the universe contains many billions of galaxies, and each galaxy contains many billions of stars.

- observe and explain that Earth has a natural satellite, the moon, that circles the planet approximately every 29 days.

- give evidence that gravity is a force that produces an attraction between matter. Gravity pulls on or anywhere near Earth toward the Earth's center and acts across space to hold the moon in its orbit around Earth and the planets in their orbits around the sun.

- illustrate that the Sun produces energy and is the major source of heat and light for Earth.

Technology

The Design Process (*Framework*, p. 92)

Students engage in problem solving, evaluating evidence, searching for connections, and the process of inquiry, in order to

- identify and work on their own problem or one developed by a peer.
- explore and illustrate possible solutions and, from these, propose one solution.
- make a plan for building a device considering the limitations of the material and including multiple views.
- evaluate designs, devices, or solutions and develop measures of quality.
- communicate the process of technological design.

Understanding and Using Technology (*Framework*, pp. 94–95)

Students engage in problem solving, evaluating evidence, searching for connections, and the process of inquiry, in order to

- use tools, materials, and machines safely and effectively.
- explain how the choice of materials depends upon their properties and characteristics and how they interact with other materials.
- use the results of material tests (i.e., hardness, tensile strength, conductivity) to suggest appropriate uses for materials.
- model the ways that multiple resources are used to develop new technologies. These include people, information, tools and machines, materials, energy, capital, and time.
- give examples that information can be communicated both graphically and electronically by a range of technological processes.
- explain how a manufacturing enterprise produces a product by converting raw materials into goods.
- identify the processes used in construction: site preparation, building, and finishing a structure.
- compare how transportation systems are devised to transport people and products on land, water, air, and in space.
- describe how power systems are used to convert and transmit mechanical, electrical, fluid, and heat energy. Describe limited (i.e., fossil fuels), unlimited (i.e., solar, gravitational) and renewable (i.e., biomass) energy sources.

- document ways that a range of tools and machines, such as measuring, hand, and optical tools, are used to implement solutions to design problems.
- explain how technological progress has been the result of cumulative work over many centuries by men and women from various cultures and races.
- describe ways that technological advances may be accompanied by negative side effects.
- explain how the evolution of technology led the change from an agricultural to an industrial to an information-based society.
- provide evidence that technology is growing at a faster rate today than ever before in history.
- describe ways in which innovations and inventions address human biological, physical, and psychological needs.

Science, Technology, and Human Affairs

Science, Technology, and Human Affairs (*Framework,* pp. 94 and 110)

Students engage in problem solving, evaluating evidence, searching for connections, and the process of inquiry, in order to

- describe situations in which science, technology, and society have influenced each other in the past.
- identify the influences that science and technology have on today's society.
- give examples that the decisions we make as individuals, groups, and communities can affect society and the natural environment and that these changes are not always easy to reverse.
- recognize and demonstrate that while technology can help us to manage societal and environmental problems, it can also have a negative impact on society and on the natural world.
- describe ways that technological devices have improved the quality of life for individuals.[22]

[22] This learning standard derives from the *Technology* strand of the *Framework*.

MCAS Reporting Categories

In *Test Item Analysis Reports* and on the *Subject Area Subscore* pages of the MCAS *School* and *District Reports,* Science & Technology test results are reported under the following five MCAS reporting categories:

- Inquiry
- Physical Sciences
- Life Sciences
- Earth and Space Sciences
- Technology

MCAS Spring 2000 Common Test Items
Science & Technology, Grade 8

Test Sessions

MCAS grade 8 Science & Technology Student Test Booklets included 3 separate test sessions. Each session included multiple-choice and open-response questions.

Reference Materials and Tools

No reference tools or materials were allowed during any Science & Technology test session.

Cross-Reference Information

The shaded bar underneath each item indicates the item's MCAS reporting category and the MCAS subcategory that contains the *Framework* learning standard(s) assessed by the item. The parentheses indicate the page(s) in this document where the learning standards may be found.

Science & Technology, Grade 8

Session 1, Multiple-Choice Questions

1. Which list contains only things that are part of our solar system?

✔ A. planets, moons, comets

B. galaxies, quasars, asteroids

C. black holes, novas, stars

D. clusters, asteroids, meteors

Reporting Category/Subcategory for Item 1: ***Earth and Space Sciences*/Earth and Space (p. 233)**

2. Which **best** describes construction technology?

A. exchanging information electronically

B. changing raw materials into goods

✔ C. building and finishing a structure

D. converting and transmitting energy

Reporting Category/Subcategory for Item 2: ***Technology*/Understanding and Using Technology (pp. 234-235)**

3. Chloroplasts in cells make it possible for the cells to

A. reproduce.

B. hold their rigid shape.

C. absorb and excrete materials.

✔ D. carry out photosynthesis.

Reporting Category/Subcategory for Item 3: ***Life Sciences*/Characteristics of Organisms (pp. 230-231)**

4. Which is an example of a chemical change?

✔ A. a rusting car fender

B. a spinning top

C. a spilled bucket of water

D. a melting popsicle

Reporting Category/Subcategory for Item 4: ***Physical Sciences*/Properties of Matter (p. 229)**

5. Mitosis occurs in living things when a cell divides to produce two cells. Compared to the original cell, how many chromosomes are in **each** of the resulting cells?

   A. half as many

✔ B. the same number

   C. twice as many

   D. an unpredictable number

Reporting Category/Subcategory for Item 5: ***Life Sciences*/Diversity, Adaptation, and Reproduction of Organisms (p. 231)**

6. How a material responds to heating and cooling tells us about the material's

   A. optical properties.

   B. mechanical properties.

✔ C. thermal properties.

   D. acoustical properties.

Reporting Category/Subcategory for Item 6: ***Technology*/Understanding and Using Technology (pp. 234-235)**

Use the table below to answer question 7.

Average Distance from the Sun and Orbital Speed of Planets in the Solar System

Planet	Average distance from the Sun (km)	Average orbital speed (km/s)
Mercury	58,000,000	47.8
Venus	108,000,000	33.9
Earth	150,000,000	29.7
Mars	228,000,000	24.1
Jupiter	779,000,000	13.7
Saturn	1,430,000,000	9.6
Uranus	2,900,000,000	6.8
Neptune	4,500,000,000	5.5
Pluto	5,950,000,000	4.8

7. Which conclusion can be drawn from this table?

✔ A. The planets closer to the Sun travel around the Sun faster.

B. The planets closer to the Sun absorb the Sun's energy and therefore move faster.

C. The outer planets move slower because they are larger.

D. The outer planets move slower because they have many moons.

Reporting Category/Subcategory for Item 7: ***Inquiry*/Analysis and Interpretation of Data (p. 228)**

Use the diagram to answer question 8.

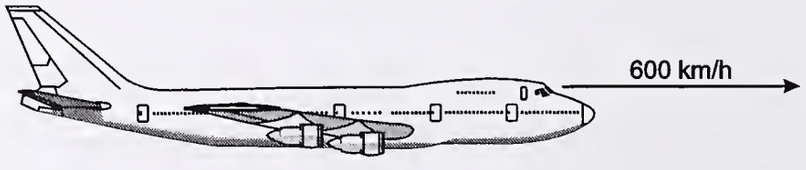
8. You are riding in an airplane that is moving at a speed of 600 km/h. If you walk from the back to the front of the airplane at a speed of 1 km/h, your speed relative to the ground is

A. 1 km/h.

B. 599 km/h.

C. 600 km/h.

✔ D. 601 km/h.



Reporting Category/Subcategory for Item 8: ***Physical Sciences*/Motion (p. 229)**

9. The engine of an automobile is part of which type of system?

   A. structure

✔ B. propulsion

   C. guidance

   D. control

Reporting Category/Subcategory for Item 9: ***Technology*/Understanding and Using Technology (pp. 234-235)**

10. Which statement is an **opinion?**

   A. Many plants are green.

✔ B. Many plants are beautiful.

   C. Plants require sunlight.

   D. Plants can grow in different places.

Reporting Category/Subcategory for Item 10: ***Inquiry*/Designing an Investigation (p. 228)**

11. Typically, sedimentary rocks are formed

   A. only in erupting volcanoes.

   B. only under great pressure and high temperatures.

   C. below Earth's surface as magma cools and crystallizes.

✔ D. from materials that settle.

Reporting Category/Subcategory for Item 11: ***Earth and Space Sciences*/Interactions and Cycles in the Earth System/ Earth's History (pp. 232-233)**

12. Which is **not** a characteristic common to organisms?

   A. requires energy

   B. reproduction

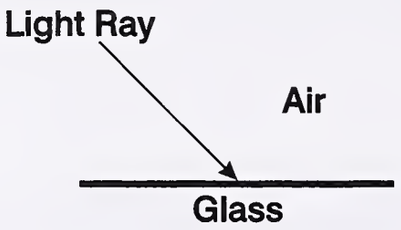
✔ C. rigidity

   D. presence of DNA

Reporting Category/Subcategory for Item 12: ***Life Sciences*/Characteristics of Organisms (pp. 230-231)**

Session 1, Open-Response Questions

13. A light ray travels through air in a straight line until it hits the surface of a piece of clear glass, as shown in the diagram below.



a. Draw two diagrams. In each diagram, show one thing that could happen to the ray of light after it hits the glass surface.

b. For each of your diagrams, describe **one** example of a way people make use of the fact that light behaves the way your diagram shows.

Reporting Category/Subcategory for Item 13: ***Physical Sciences*/Energy (p. 230)**

14. You are to study a 10-meter by 10-meter square plot of land in a wooded area. The plot includes trees, shrubs, small plants, a variety of animals, and other living and nonliving things. People and the elements of nature have an effect on this land.

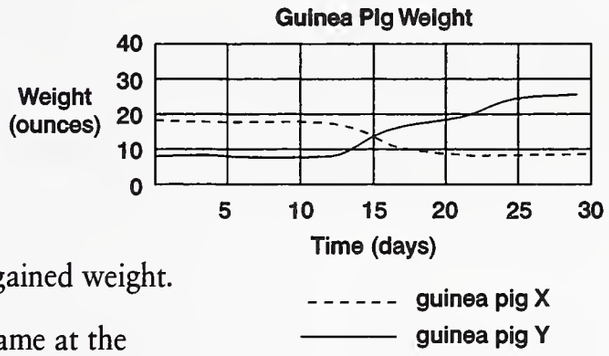
a. Describe **three** changes that you would most likely observe in the living and/or nonliving things in the plot of land during the school year.

b. Describe an experiment you could conduct to test the impact of changes in **one** of the following factors on the living and/or nonliving things in the plot of land: amount of light, weather conditions, average temperature, soil characteristics, development of new plants or animals, environmental influences, and predator-prey relationships.

Reporting Category/Subcategory for Item 14: ***Inquiry*/Designing an Investigation (p. 228)**

Session 2, Multiple-Choice Questions

Use the graph to answer question 15.



15. Two guinea pigs were put on different diets for a month. The graph shows what happened to their weight. According to the information on the graph, which statement is correct?

A. Guinea pig Y lost weight while guinea pig X gained weight.

B. Guinea pig X and guinea pig Y weighed the same at the beginning of the experiment.

✔ C. Guinea pig X and guinea pig Y weighed the same on day 15.

D. Guinea pig Y lost weight until day 15 and then gained weight.

Reporting Category/Subcategory for Item 15: ***Inquiry*/Analysis and Interpretation of Data (p. 228)**

16. The living systems of plants and animals are constantly taking in water to continue the processes of life. What eventually happens to **most** of that water?

A. It is converted into hydrogen and oxygen.

✔ B. It is returned to the environment.

C. It is broken down by bacterial decay.

D. It is permanently combined with other compounds.

Reporting Category/Subcategory for Item 16: ***Life Sciences*/Characteristics of Organisms (pp. 230-231)**

17. Scientists classify matter into various groups. Which group is typically described by the characteristics listed below?

- usually solid at room temperature
- can be bent or changed in shape without breaking
- show a shiny luster when scratched or polished

✔ A. metals

B. nonmetals

C. elements

D. compounds

Reporting Category/Subcategory for Item 17: ***Physical Sciences*/Properties of Matter (p. 229)**

Use the diagram to answer question 18.

18. The diagram shows the conditions for which phase of the Moon?

    A. full

    B. crescent

    C. quarter

✔ D. new

Reporting Category/Subcategory for Item 18: ***Earth and Space Sciences*/Earth and Space (p. 233)**

19. The bottom of the space shuttle is covered with ceramic tile. This material was chosen because it withstands

    A. moisture.

    B. vibration.

✔ C. heat.

    D. light.

Reporting Category/Subcategory for Item 19: ***Technology*/Understanding and Using Technology (pp. 234-235)**

20. Which is **not** a significant reason why people are living longer today than 100 years ago?

✔ A. development of sugar substitutes

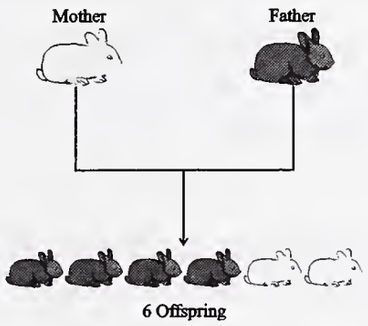
    B. development of medicines

    C. better health care

    D. better nutrition

Reporting Category/Subcategory for Item 20: ***Technology*/Science, Technology, and Human Affairs (p. 235)**

Use the drawing below to answer question 21.



21. In rabbits, the gene for black fur is dominant over the gene for white fur. How can the appearance of white baby rabbits be explained when the mother has white fur and the father has black fur?

    A. The mother rabbit has one gene for black fur and one gene for white fur.

✔ B. The father rabbit has one gene for black fur and one gene for white fur.

    C. The mother rabbit has two genes for black fur.

    D. The father rabbit has two genes for black fur.

Reporting Category/Subcategory for Item 21: ***Life Sciences*/Diversity, Adaptation, and Reproduction of Organisms (p. 231)**

22. Which statement about the molecules in ice and the molecules in liquid water is correct?

    A. The molecules in ice have more energy than the molecules in liquid water.

    B. The molecules in ice contain different atoms than the molecules in liquid water.

    C. The molecules in ice have more electric charge than the molecules in liquid water.

✔ D. The molecules in ice are less free to move than the molecules in liquid water.

Reporting Category/Subcategory for Item 22: ***Physical Sciences*/Properties of Matter (p. 229)**

Use the information in the box below to answer question 23.

> Many people are concerned that the reduction in the number of acres of forested area on Earth will lead to a large reduction in the amount of oxygen in Earth's atmosphere.

23. If this happens, an organism's ability to breathe would be affected. The effect would be similar to moving the organism from

✔ A. sea level to a mountaintop.

B. sea level to a valley below sea level.

C. a mountaintop to sea level.

D. a beach at sea level to a valley at sea level.

Reporting Category/Subcategory for Item 23: ***Earth and Space Sciences*/Interactions and Cycles in the Earth System/ Earth's History (pp. 232-233)**

24. Which is the best evidence for the theory of continental drift?

A. the appearance of volcanoes at the boundaries where plates collide

B. earthquakes at boundaries where one plate slides past another

C. cases where a species exists in only one isolated place

✔ D. fossils of the same species found on widely separated continents

Reporting Category/Subcategory for Item 24: ***Earth and Space Sciences*/Interactions and Cycles in the Earth System/ Earth's History (pp. 232-233)**

25. The periodic table of the elements is systematically organized according to the

A. rate at which the elements chemically react.

B. hardness of the elements.

✔ C. structure of the atoms of the elements.

D. radioactivity of the atoms of the elements.

Reporting Category/Subcategory for Item 25: ***Physical Sciences*/Properties of Matter (p. 229)**

Session 2, Open-Response Question

26. There are various theories as to how dinosaurs became extinct. One theory suggests that the extinction of dinosaurs was caused by a meteorite impact. Another theory suggests that increased volcanic activity may have caused the dinosaurs to die off.

    Explain how **either** a meteorite impact **or** increased volcanic activity could have caused the extinction of dinosaurs. Be sure to describe **two** pieces of scientific evidence that support your explanation.

Reporting Category/Subcategory for Item 26: ***Earth and Space Sciences*/Interactions and Cycles in the Earth System/ Earth's History (pp. 232-233)**

Session 3, Multiple-Choice Questions

Read the description of the experiment in the box below to answer question 27.

> One hundred pea seeds were put in petri dishes and covered with wet paper towels. The petri dishes were then put inside black plastic bags. Half of them were placed in an incubator set to 10°C. The remaining half were placed in an incubator set to 30°C.

27. This experiment was most likely designed to study the effect of which variable on the germination of pea seeds?

✔ A. temperature

B. water

C. light

D. seed type

Reporting Category/Subcategory for Item 27: ***Inquiry*/Designing an Investigation (p. 228)**

28. Which is the best way to generate an electrical current in a coil of wire?

A. stroking the coil with a piece of silk

B. heating the coil uniformly

C. laying the coil near a magnet

✔ D. rotating the coil in a magnetic field

Reporting Category/Subcategory for Item 28: ***Physical Sciences*/Energy (p. 230)**

29. Which **best** illustrates the sequence of steps that should be followed when solving technological problems?

A. Identify the problem, evaluate the solution, explore possible solutions, and select a solution.

✔ B. Identify the problem, explore possible solutions, select a solution, and evaluate the solution.

C. Identify the problem, select a solution, explore possible solutions, and evaluate the solution.

D. Identify the problem, evaluate the solution, select a solution, and explore possible solutions.

Reporting Category/Subcategory for Item 29: ***Technology*/The Design Process (p. 234)**

30. How does a mushroom obtain energy?

A. by attaching to green plants and taking the plants' food

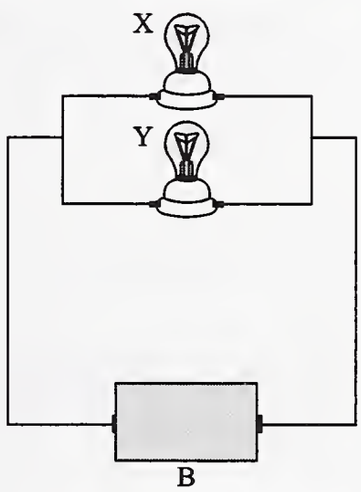
B. by combining carbon dioxide and water to make its own food

✔ C. by absorbing matter from dead organisms to use as food

D. by attacking bacteria and using the bacteria as food

Reporting Category/Subcategory for Item 30: ***Life Sciences*/Ecosystems and Organisms (p. 231)**

Use the drawing to answer question 31.



31. In the drawing, lightbulbs X and Y are wired in parallel and connected to battery B so that both bulbs are lit. Which statement **best** describes what would happen if lightbulb X burned out?

A. The battery would no longer be usable.

B. The socket holding lightbulb X would become warmer.

C. Lightbulb Y would also burn out.

✔ D. Lightbulb Y would continue to be lit.

Reporting Category/Subcategory for Item 31: ***Physical Sciences*/Energy (p. 230)**

32. Which is an example of asexual reproduction?

✔ A. one cell divides into two cells

B. two cells unite to form one cell

C. a gene in a cell mutates

D. egg cells are produced

Reporting Category/Subcategory for Item 32: ***Life Sciences*/Diversity, Adaptation, and Reproduction of Organisms (p. 231)**

33. Signs in many stores and restaurants warn that microwaves are in use. What is the main reason for this warning?

A. Some people do not like food cooked in microwave ovens.

B. Microwaves sometimes affect people's sense of sight.

C. Microwaves sometimes cause hair or teeth to fall out.

✔ D. Some people have pacemakers that may be affected by microwaves.

Reporting Category/Subcategory for Item 33: ***Technology*/Science, Technology, and Human Affairs (p. 235)**

34. The first stage of soil formation is the weathering of rock into fine particles. To make a good soil for growing plants, which would be **best** to add to the rock particles?

A. minerals

B. sand

✔ C. organic matter

D. silt

Reporting Category/Subcategory for Item 34: ***Earth and Space Sciences*/Interactions and Cycles in the Earth System/Earth's History (pp. 232-233)**

Use the information and table below to answer question 35.

Curtis conducted an experiment to see if some liquids mix with Liquid X. His results are shown in the table.

Results of Curtis's Experiment

Type of Liquid	Mixes with Liquid X
Gasoline	No
Vegetable Oil	No
Kerosene	No
Turpentine	No

35. Based on this data, which is the best conclusion?

A. Liquid X cannot mix with any other liquid.

B. Liquid X must be able to mix with some other liquid.

✔ C. Liquid X cannot mix with these four liquids.

D. Liquid X can mix with most other liquids.

Reporting Category/Subcategory for Item 35: ***Inquiry*/Analysis and Interpretation of Data (p. 228)**

36. Which is the **best** example of something that has kinetic energy?

A. a rock sitting at the top of a steep hill

✔ B. a tennis ball rolling across the court

C. a picture hanging on the wall

D. a piece of wood before it is burned

Reporting Category/Subcategory for Item 36: ***Physical Sciences*/Energy (p. 230)**

37. What type of force keeps the planets orbiting the Sun?

✔ A. gravitational

B. magnetic

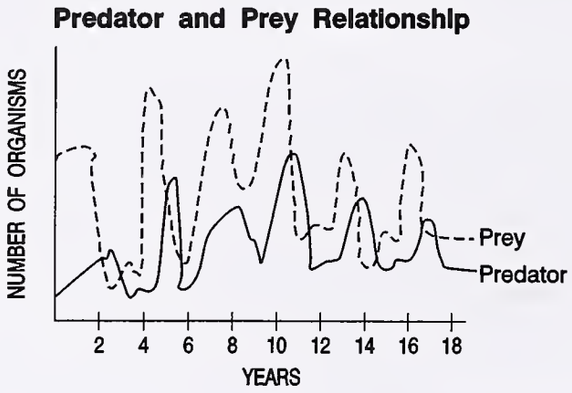
C. electrical

D. nuclear

Reporting Category/Subcategory for Item 37: ***Earth and Space Sciences*/Earth and Space (p. 233)**

Session 3, Open-Response Questions

Use the graph below to answer question 38.



38. The graph shows fluctuations in the numbers of predators and their prey. Explain in detail why these fluctuations occur and how they are related.

Reporting Category/Subcategory for Item 38: ***Life Sciences*/Ecosystems and Organisms (p. 231)**

39. A community has decided to close its landfill.

    a. What are **three** realistic alternatives that the community could consider to dispose of its trash?

    b. What is one advantage and one disadvantage to each alternative?

Reporting Category/Subcategory for Item 39: ***Technology*/Science, Technology, and Human Affairs (p. 235)**

X. Science & Technology,

Grade 10

Science & Technology, Grade 10

The spring 2000 MCAS Science & Technology test was based on the learning standards of the Massachusetts *Science & Technology Curriculum Framework* (1996). The *Framework* defines four content strands, with three major divisions within the *Domains of Science* strand:

- *Inquiry*
- *Domains of Science*
  - *Physical Sciences*
  - *Life Sciences*
  - *Earth and Space Sciences*
- *Technology*
- *Science, Technology, and Human Affairs*

The MCAS publication, *Guide to the Massachusetts Comprehensive Assessment System: Science & Technology,* further divides these strands (except for *Science, Technology, and Human Affairs*) into multiple subcategories for each grade. These MCAS subcategories are specifically referenced in the MCAS document, *Guide to Interpreting the 2000 MCAS Reports for Schools and Districts,* due for release later in 2000.

Curriculum Framework *Learning Standards*

Learning standards are grouped below by *Framework* content strand and related MCAS subcategory.[23] Applicable *Framework* page numbers are given in parentheses following each heading.

[23] A very small percentage—less than 1%—of *Science & Technology Curriculum Framework* learning standards that are impractical to test in a large-scale assessment are not tested by MCAS (e.g., at grade 10: "use a range of exploratory techniques, e.g., experiments, information/literature searches, data logging, research and development"). These learning standards are not included in this document.

Inquiry

Designing an Investigation (*Framework*, pp. 28–29)

Students engage in problem solving, evaluating evidence, searching for connections, and the process of inquiry, in order to

- distinguish those observations that are relevant to the question or problem at hand.
- formulate testable questions and generate explanations using the results of predictions.
- use a range of exploratory techniques, e.g., experiments, information/literature searches, data logging, research, and development, etc.
- make decisions about the range and number of independent variables and how to control other variables in designing experiments.
- select and use common and specialized tools to measure the dependent variable.
- select appropriate methods of recording and interpreting data.

Analysis and Interpretation of Data (*Framework*, p. 29)

Students engage in problem solving, evaluating evidence, searching for connections, and the process of inquiry, in order to

- accurately use scientific and technological nomenclature, symbols and conventions when representing and communicating ideas, procedures, and findings.
- select appropriate means for representing, communicating, and defending a scientific and technological argument.
- question interpretations or conclusions for which there is insufficient supporting evidence, and recognize that any conclusion can be challenged by further evidence.
- formulate further testable hypotheses based on the knowledge and understanding generated.
- interpret data in the light of experimental findings, and appropriate scientific and technological knowledge and understanding.

Domains of Science: Physical Sciences

Structure of Matter (*Framework*, p. 50)

Students engage in problem solving, evaluating evidence, searching for connections, and the process of inquiry, in order to

- explore and describe how matter is made up of elements, compounds, and numerous mixtures of these two kinds of substances.
- demonstrate through the use of manipulatives that atoms interact with one another by transferring or sharing electrons that are furthest from the nucleus.
- represent an understanding that compounds form when atoms of two or more elements bond.

- group elements and compounds into classes, based on similarities in their structures and resulting properties.
- describe an understanding that nuclear changes often result in the emission of high-energy electromagnetic radiation and particles, and present evidence on ways that this has physical repercussions on other materials.
- illustrate an understanding that energy [that] is released in certain nuclear reactions and chemical reactions can be controlled and put to use, or released suddenly and destructively in explosions, fire, or high-energy chemical events.

Interactions of Substances (*Framework,* p. 50)

Students engage in problem solving, evaluating evidence, searching for connections, and the process of inquiry, in order to

- present evidence that solubility of substances may vary with temperature and with the natures of the solute and the solvent.
- suggest how balanced electrical forces between the charges of the protons and electrons are responsible for the stability of substances.
- explain chemical changes in terms of rearrangements of atoms or molecules, which are made possible by the breaking and forming of chemical bonds.
- summarize chemical reactions by symbolic or word equations that specify the reactants and products involved.
- illustrate ways in which the periodic table is useful in predicting the chemical and physical properties of known elements and those yet to be discovered.

Position and Motion of Objects (*Framework,* p. 51)

Students engage in problem solving, evaluating evidence, searching for connections, and the process of inquiry, in order to

- demonstrate that all forces are vector quantities, having both magnitude and direction.
- represent an understanding that if an object exerts a force on a second object, then the second object exerts an equal and opposite force on the first object.
- describe and represent changes in motion or momentum in terms of being caused by forces.

Energy (*Framework,* p. 51)

Students engage in problem solving, evaluating evidence, searching for connections, and the process of inquiry, in order to

- explore and explain how the total amount of mass and energy remains constant in any closed system.
- describe the nature of waves, such as electromagnetic waves or sound waves, in terms of wave length, amplitude, frequency, and characteristic speed.
- design and conduct an investigation that explores how electromagnetic waves, unlike sound waves, can be transmitted through a vacuum.

(continued on next page)

- demonstrate that the same concepts of energy, matter and their interaction apply both to biological and physical systems on Earth and in the observable universe.

Domains of Science: Life Sciences

Characteristics of Organisms (*Framework,* p. 65)

Students engage in problem solving, evaluating evidence, searching for connections, and the process of inquiry, in order to

- examine evidence and demonstrate that many molecular aspects of life processes of multicellular organisms occur in cells.
- investigate and describe understanding that cells have particular structures that underlie their functions.
- compare and contrast the cell boundaries that control what can enter and leave the cell. Realize that in all but quite primitive cells, a complex network of proteins provides organization and shape.
- give evidence that all organic molecules are constructed of four fundamental elements, i.e., carbon, hydrogen, oxygen and nitrogen.

Heredity and Evolution (*Framework,* pp. 65–66)

Students engage in problem solving, evaluating evidence, searching for connections, and the process of inquiry, in order to

- describe the theory of biological evolution which states that the earth's present-day species are descended from earlier species.
- describe ways in which genetic variation is preserved or eliminated from a population through natural selection.
- examine and summarize evidence that evolution builds on what already exists, so the more variety there is, the more there can be in the future. But know that evolution does not necessitate long-term progress in some set direction.
- give evidence that cells are the repositories of biological information.
- explore and illustrate that chromosomes are the components of cells which convey hereditary information from one cell to its daughter cells and from a parent to its offspring.
- illustrate an understanding that chromosomes are composed of subunits called genes; each gene encodes the information directing the synthesis of a cell product, usually a protein, and can often be identified with a trait observed in the organism.
- describe the structure and function of DNA.

- give evidence that in reproductive processes involving two parents (sexual reproduction), two specialized reproductive cells (gametes), one from each parent (zygote), direct the formation of a new organism that has attributes of both parents.

- discriminate between characteristics that result from the operation of a single gene and some that result from the action of several genes.

Ecosystems (*Framework,* p. 66)

Students engage in problem solving, evaluating evidence, searching for connections, and the process of inquiry, in order to

- examine and describe ways in which the conservation of energy law is a powerful tool for the analysis of energy flow in ecosystems.

- demonstrate an understanding that energy is supplied to ecosystems by sunlight and dissipates as heat. Know that the principal pathway of this dissipation is cellular respiration.

- illustrate an understanding that plants convert light energy into chemical energy.

- explore and illustrate why carbon compounds produced by plants (carbohydrates and oils) are the primary source of energy for all animal life.

Domains of Science: Earth and Space Sciences

Earth's Processes (*Framework,* pp. 80–81)

Students engage in problem solving, evaluating evidence, searching for connections, and the process of inquiry, in order to

- demonstrate an understanding that two fundamental forces acting in the Earth System are gravity and electromagnetism. Examine evidence that gravitational force acts between masses and is responsible for changes in the motion of objects on Earth and throughout the universe. Know that electromagnetic force holds matter together; recognize that the Earth itself acts like a magnet.

- observe and illustrate that life is adapted to conditions on the Earth, including the force of gravity that enables the planet to retain an adequate atmosphere, and an intensity of radiation from the sun that allows water to cycle between liquid and vapor.

- examine and give evidence that life has changed the planet in dramatic ways; vegetation and other life forms make important contributions to changes in the face of Earth.

- examine and describe evidence that rocks are continuously being modified by processes such as weathering, erosion, deposition, compaction, cementation, melting, heating (without melting), pressure, and crystallization.

(continued on next page)

- examine models and illustrate that global wind patterns within the atmosphere are determined by the unequal heating between the equator and poles, Earth's rotation, and the distribution of land and ocean. Consequently, weather in northern and southern mid-latitudes tends to move eastward while in the tropics it moves westward. Illustrate understanding that atmospheric winds transport heat poleward from the warm tropics, helping to maintain Earth's climate.

- relate and demonstrate an understanding that the solid crust of the Earth—including both the continents and the ocean basins—consists of separate plates that ride on a denser, hot, gradually deformable layer of the Earth.

- investigate and illustrate the theory that land forms of various shapes and sizes result from both constructive and destructive processes.

- examine and describe evidence that the "solid" Earth has a layered structure, with each layer having characteristic composition and physical properties. A solid inner core is surrounded by a liquid outer core, which in turn is surrounded by a large zone of dense mantle material. The crust is relatively thin compared to the other layers of Earth's interior.

Solar System and Universe (*Framework*, p. 80)

Students engage in problem solving, evaluating evidence, searching for connections, and the process of inquiry, in order to

- give evidence that the universe is estimated to be over ten billion years old, and know some of the evidence for this estimate.

- examine and describe evidence that led to the theory that the Solar System was formed from a cloud of gas and dust that condensed under the influences of gravity and rotation.

- examine and describe evidence that the Milky Way is but one galaxy in a vast, ancient, and expanding universe, which contains a tremendous number of galactic clusters. Convey understanding that most of the universe appears to be empty space, but that more and more kinds of materials are being discovered in interstellar space.

Technology

The Design Process (*Framework*, p. 96)

Students engage in problem solving, evaluating evidence, searching for connections, and the process of inquiry, in order to

- identify a problem or design opportunity that has not necessarily been solved before.

- propose designs and choose among suggested solutions.

- implement a proposed solution that conforms to the design constraints.
- evaluate the solution and its consequences against planned criteria.
- communicate the problem, process and solution.
- redesign the solution.

Understanding and Using Technology (*Framework*, pp. 99–100)

Students engage in problem solving, evaluating evidence, searching for connections, and the process of inquiry, in order to

- describe examples of the wide range of contemporary tools that are used to process and measure materials, energy, physical phenomena, and electronic signals. Some of these include measuring instruments, computer-based tools, and data-capturing sensors.
- use complex tools, machines, and equipment to solve problems.
- identify appropriate ways to select, operate, maintain, and dispose of technological devices.
- identify particular characteristics of material resources, i.e., synthetic, composite, and biological. Explain how various energy sources and forms of information are also resources with specific characteristics.
- discuss issues of resource management including safety, costs, environmental and political concerns.
- give examples of how combinations of graphic and electronic communication processes are used in developing high technology communication systems.
- describe uses of material conversion processes, i.e., separating, forming, conditioning and combining, in production processes.
- identify ways that manufacturing processes have changed with improved tools and techniques.
- compare how existing transportation technologies convey people and products globally.
- give examples of ways in which technological processes could adversely affect the environment.
- give examples of how a technology device, service, or system is used for a particular purpose.
- give examples of how technology has played a key role in the operation of successful Massachusetts and United States businesses.

(continued on next page)

- describe examples of new and emerging technologies in areas of communication, construction, manufacturing, transportation, power, and bio-related technology.
- provide examples of how technology creates new jobs and makes other jobs obsolete.

Science, Technology, and Human Affairs

Science, Technology, and Human Affairs (*Framework,* pp. 99 and 111)

Students engage in problem solving, evaluating evidence, searching for connections, and the process of inquiry, in order to

- describe ways in which technological impacts can be multidimensional (i.e., economic, social, environmental, political).[24]
- describe ways in which technological inventions and innovations stimulate economic competitiveness and are translated into products and services with marketplace demands.[25]
- participate in technological society as active citizens, consumers, workers, employers, and family members.[26]
- identify situations in which science, technology, and society have influenced each other in the past and describe how science and technology have been an integral part of the history of human society.
- describe situations that illustrate how scientific and technological revolutions have changed society.
- develop skills in applying scientific knowledge to make decisions about problems at the community, state, national and international levels, and recognize that using these skills responsibly is an essential part of being a citizen in today's world.
- describe ways in which technological development has been influenced by the culture of the society and by the resources available to that society.
- give evidence that rapidly changing technology affects global competition and jobs.

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[24] This learning standard derives from the *Technology* strand of the *Framework*.
[25] See note 24.
[26] See note 24.

MCAS Reporting Categories

In *Test Item Analysis Reports* and on the *Subject Area Subscore* pages of the MCAS *School* and *District Reports,* Science & Technology test results are reported under the following five MCAS reporting categories:

- Inquiry
- Physical Sciences
- Life Sciences
- Earth and Space Sciences
- Technology

MCAS Spring 2000 Common Test Items
Science & Technology, Grade 10

Test Sessions

MCAS grade 10 Science & Technology Student Test Booklets included 3 separate test sessions. Each session included multiple-choice and open-response questions.

Reference Materials and Tools

No reference tools or materials were allowed during any Science & Technology test session.

Cross-Reference Information

The shaded bar underneath each item indicates the item's MCAS reporting category and the MCAS subcategory that contains the *Framework* learning standard(s) assessed by the item. The parentheses indicate the page(s) in this document where the learning standards may be found.

Session 1, Multiple-Choice Questions

1. The Sun is only one of billions of

   A. nebulas.

✔ B. stars.

   C. galaxies.

   D. quasars.

Reporting Category/Subcategory for Item 1: ***Earth and Space Sciences*/Solar System and Universe (p. 260)**

2. Which statement **does not** provide evidence that Earth's crust consists of separate plates that move relative to one another?

   A. The Pacific Ocean is ringed by regions that experience frequent volcanic eruptions and earthquakes.

   B. The area of the floor of the Atlantic Ocean closest to the continents has the oldest rocks.

   C. Fossils found in South America and Africa are similar.

✔ D. The Gulf Stream flows northward along the coastline of the Atlantic Ocean.

Reporting Category/Subcategory for Item 2: ***Earth and Space Sciences*/Earth's Processes (pp. 259-260)**

3. A 2,000-kg car accelerates at a constant rate of 3 m/s^2. How much net force must be applied to accelerate this car at that rate?

   A. 667 $kg \cdot m/s^2$

   B. 0.0015 $kg \cdot m/s^2$

✔ C. 6,000 $kg \cdot m/s^2$

   D. 18,000 $kg \cdot m/s^2$

Reporting Category/Subcategory for Item 3: ***Physical Sciences*/Position and Motion of Objects (p. 257)**

4. A white, crystalline solid is heated in a test tube. The student observes that a vapor comes out of the test tube and that a clear liquid forms at the cool open end of the tube. The solid also darkens, melts, and turns almost black upon continued heating. The solid is probably

✔ A. sugar.

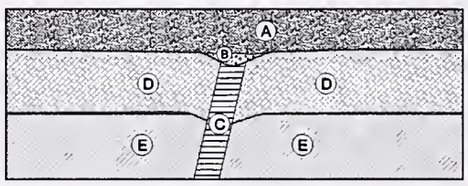
B. snow.

C. table salt.

D. limestone.

Reporting Category/Subcategory for Item 4: ***Physical Sciences*/Interactions of Substances (p. 257)**

Use the diagram to answer question 5.



5. Given the diagram and the Law of Superposition, identify the sequence that shows the rock layers in order from oldest to youngest.

A. E, D, A, C, B

B. C, B, E, D, A

C. C, B, A, D, E

✔ D. E, D, C, B, A

Reporting Category/Subcategory for Item 5: ***Earth and Space Sciences*/Earth's Processes (pp. 259-260)**

6. An element with properties similar to those of sodium and potassium is likely to be

A. a gas.

B. a liquid.

✔ C. an active metal.

D. an inert gas.

Reporting Category/Subcategory for Item 6: ***Physical Sciences*/Structure of Matter (pp. 256-257)**

Session 1, Open-Response Questions

7. Animals and plants in New England adapt to the environmental changes that accompany the transition from summer to fall.

   a. Describe **two** of the environmental changes that accompany the transition from summer to fall in New England.

   b. Identify and explain **three** ways in which living organisms in this ecosystem adapt to these seasonal changes in the environment. Include at least **one** plant and **one** animal adaptation.

Reporting Category/Subcategory for Item 7: ***Life Sciences*/Heredity and Evolution (pp. 258-259)**

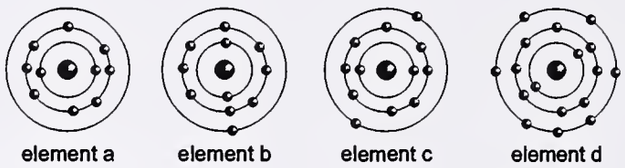
8. Major building projects, like the Ted Williams Tunnel in Boston and the Hoosac Tunnel in North Adams, involve major areas of technology such as construction, manufacturing, transportation, and communications.

   Identify a major building project and describe how **two** areas of technology contributed to the completion of the project.

Reporting Category/Subcategory for Item 8: ***Technology*/Understanding and Using Technology (pp. 261-262)**

Session 2, Multiple-Choice Questions

Use the diagram on the right to answer question 9.



9. Which element would give up one electron in forming an ionic bond?

   A. element a

   ✔ B. element b

   C. element c

   D. element d

Reporting Category/Subcategory for Item 9: ***Physical Sciences*/Structure of Matter (pp. 256-257)**

10. Which statement about cell theory is **not** accurate?

   ✔ A. Cells vary in size but have the same shape.

   B. All organisms are made of one or more cells.

   C. All cells carry on their own life activities.

   D. New cells arise from other living cells.

Reporting Category/Subcategory for Item 10: ***Life Sciences*/Characteristics of Organisms (p. 258)**

11. If a designer wants to show the relationship of components in an electrical or mechanical system, the information would best be conveyed through the use of a

   A. pie chart.

   B. mock-up design.

   ✔ C. schematic diagram.

   D. specification sheet.

Reporting Category/Subcategory for Item 11: ***Technology*/The Design Process (pp. 260-261)**

12. A student is asked to demonstrate that diffusion through a membrane depends upon molecular size and upon the concentration of molecules on each side of the membrane. Which group of materials is **best** used to help demonstrate these principles?

A. scalpel, heat source, probe, beaker, water, graduated cylinder, balance

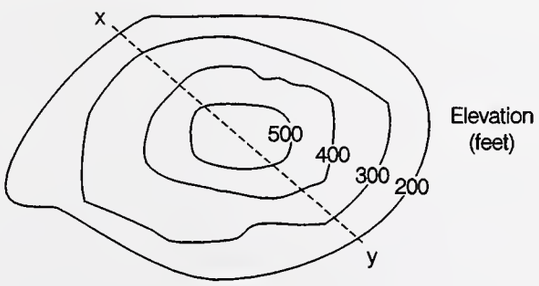
B. beakers, salt, Benedict's solution, microscope, iodine, forceps, heat source

C. dialysis tubing, forceps, microscope, graduated cylinder, iodine

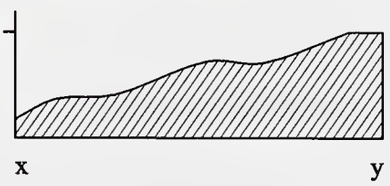
✔ D. beaker, iodine, dialysis tubing, sugar and starch solution, Benedict's solution, heat source

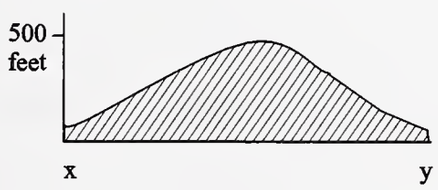
Reporting Category/Subcategory for Item 12: ***Life Sciences*/Characteristics of Organisms (p. 258)**

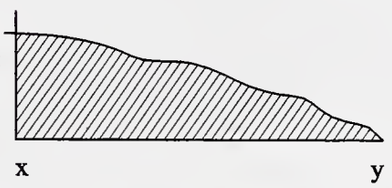
Use the diagram below to answer question 13.

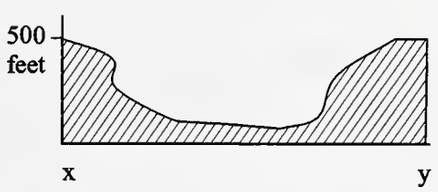


13. Which graph below represents the map profile along a straight line from point x to point y?

A.


✔ B.


C.


D.


Reporting Category/Subcategory for Item 13: ***Earth and Space Sciences*/Earth's Processes (pp. 259-260)**

Use the information in the box below to answer question 14.

Joanne took a Styrofoam™ cup half-filled with sand, covered it, punched a hole in the cover, inserted a thermometer, and recorded the temperature of the cup's contents. She then shook the cup for 5 minutes and again recorded the temperature. She recorded the following temperature data:

Reading #1: 20°C
Reading #2: 24°C

14. The **most likely** explanation for these data is

A. the heat from Joanne's hand was transferred to the contents of the cup to increase the temperature.

B. the sand particles in the cup reacted chemically, giving off heat.

✔ C. the friction of the sand particles moving against each other, the air, and the cup produced heat.

D. the warm air from the room entered the cup through the hole in its cover.

Reporting Category/Subcategory for Item 14: ***Physical Sciences*/Energy (pp. 257-258)**

15. Which is the **first** step in the design process?

A. develop a model

B. evaluate your design

C. identify possible solutions

✔ D. identify the problem

Reporting Category/Subcategory for Item 15: ***Technology*/The Design Process (pp. 260-261)**

16. The following sequence represents a food chain from the bottom to the top:

    plankton → krill → squid → penguins → leopard seals → orca whales

    If squid were over-harvested by commercial fishing, which population of organisms would **most likely** increase?

    A. plankton

✔ B. krill

    C. penguins

    D. leopard seals

Reporting Category/Subcategory for Item 16: ***Life Sciences*/Ecosystems (p. 259)**

17. A solid metal object with a mass of 50.4 grams is put into a red liquid with a total mass of 300.0 grams. The metal object sinks to the bottom of the red liquid. The same metal object is retrieved from the bottom of the red liquid and put into mercury. The metal floats in the mercury. Which statement would be **most** correct based on the observations?

✔ A. The density of the red liquid is less than the density of the mercury.

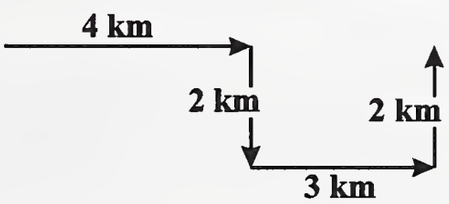
    B. The mass of the mercury must be greater than the mass of the red liquid.

    C. The volume of the red liquid must be less than the volume of the mercury.

    D. A larger metal object made of the same metal would sink in the mercury.

Reporting Category/Subcategory for Item 17: ***Inquiry*/Designing an Investigation (p. 256)**

18. John walks four kilometers east, two kilometers south, three kilometers east, and two kilometers north as shown by the diagram.



    What is John's displacement?

    A. 11 km

✔ B. 7 km east

    C. 2 km north

    D. 4 km

Reporting Category/Subcategory for Item 18: ***Physical Sciences*/Position and Motion of Objects (p. 257)**

19. Using manufactured goods and materials to build a structure on site is called

A. manufacturing.

B. goods and services.

✔ C. construction.

D. transportation.

Reporting Category/Subcategory for Item 19: ***Technology*/Understanding and Using Technology (pp. 261-262)**

20. Which process utilizes energy from glucose to produce ATP?

A. transcription

B. photosynthesis

✔ C. cellular respiration

D. transpiration

Reporting Category/Subcategory for Item 20: ***Life Sciences*/Ecosystems (p. 259)**

21. If an adult female shark has 20 chromosomes in each body cell, how many chromosomes would you predict to be present in each of her unfertilized egg cells?

A. 5

✔ B. 10

C. 15

D. 20

Reporting Category/Subcategory for Item 21: ***Life Sciences*/Heredity and Evolution (pp. 258-259)**

22. Which energy resource is **not** renewable?

A. biomass energy

B. geothermal energy

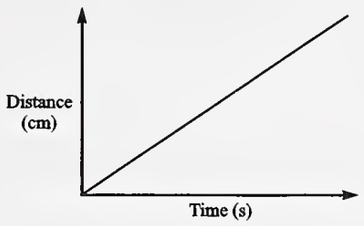
C. solar energy

✔ D. fossil fuel energy

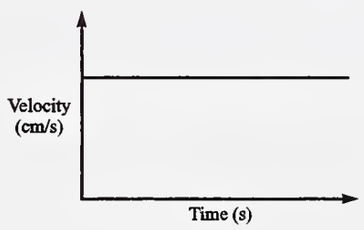
Reporting Category/Subcategory for Item 22: ***Technology*/Understanding and Using Technology (pp. 261-262)**

23. Which graph represents an object traveling with a constant acceleration?

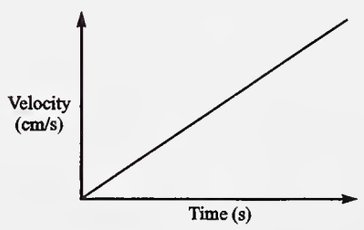
A.



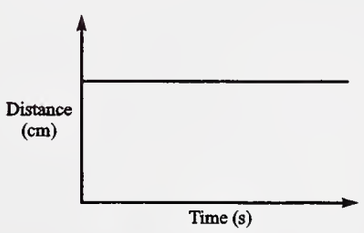
B.



✔ C.



D.



Reporting Category/Subcategory for Item 23: ***Physical Sciences*/Position and Motion of Objects (p. 257)**

Session 2, Open-Response Questions

24. Some of the water that falls on the ground as precipitation percolates (seeps) into the soil.

    a. Explain **two** processes by which this water eventually returns to the atmosphere.

    b. Diagram and label the water cycle.

Reporting Category/Subcategory for Item 24: ***Earth and Space Sciences*/Earth's Processes (pp. 259-260)**

25. Explain in terms of polarity how detergent molecules can both dissolve grease molecules and mix freely with water molecules. You may include a labeled drawing as part of your answer.

Reporting Category/Subcategory for Item 25: ***Physical Sciences*/Structure of Matter (pp. 256-257)**

Session 3, Multiple-Choice Questions

26. The pesticide DDT accumulates in the fatty tissue of animals and is transferred along food chains. DDT's concentration increases along each link of a food chain. Which of the following organisms would accumulate the **highest** concentration of DDT in a food chain?

    A. corn (a producer)

    ✔ B. owl (a predator)

    C. rabbit (a herbivore)

    D. field mouse (a primary consumer)

Reporting Category/Subcategory for Item 26: ***Life Sciences*/Ecosystems (p. 259)**

27. The isotope of carbon, called carbon-14, can be used to date materials less than 50,000 years old. Which of the following could be dated using carbon-14?

    A. Mesozoic plant fossils

    B. trilobite fossils

    C. dinosaur bones

    ✔ D. human bones

Reporting Category/Subcategory for Item 27: ***Earth and Space Sciences*/Earth's Processes (pp. 259-260)**

28. The **most external** structure in a plant cell is the

    A. mitochondria.

    B. centriole.

    C. cell membrane.

    ✔ D. cell wall.

Reporting Category/Subcategory for Item 28: ***Life Sciences*/Characteristics of Organisms (p. 258)**

29. The subatomic particles **most** involved in the formation of a chemical bond are

✔ A. electrons.

B. neutrons.

C. protons.

D. quarks.

Reporting Category/Subcategory for Item 29: ***Physical Sciences*/Structure of Matter (pp. 256-257)**

30. Matter may be classified as an element, a compound, or a mixture. Which of the following lists includes **only** mixtures?

A. dry ice, alcohol, brass

✔ B. sea water, milk, air

C. copper, gasoline, bread

D. paint, blood, mercury

Reporting Category/Subcategory for Item 30: ***Physical Sciences*/Structure of Matter (pp. 256-257)**

31. The **most** important way that surface ocean currents affect climate is by

A. absorbing moisture from the air.

B. reflecting sunlight back into space.

C. changing the direction of global wind patterns.

✔ D. bringing cold water to warm areas and warm water to cold areas.

Reporting Category/Subcategory for Item 31: ***Earth and Space Sciences*/Earth's Processes (pp. 259-260)**

Use the information below to answer question 32.

Water Quality

Table 1 lists the concentration of various compounds at four different sites. Water sampling at all sites was done simultaneously and under the same conditions using the same kind of equipment. The water samples were taken to the lab for analysis.

Figure A

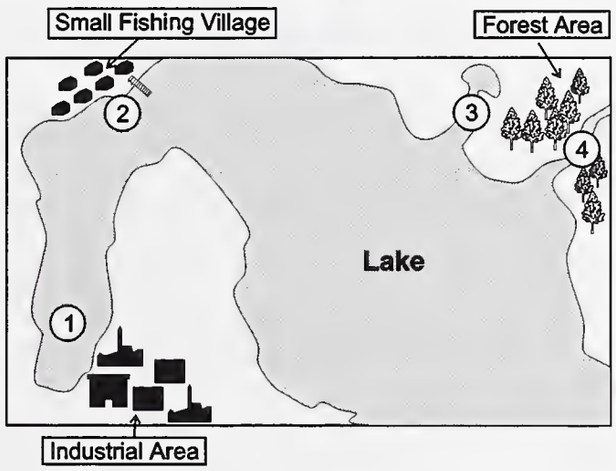


Table 1

Sampling Site	Site Characteristics	Concentration of dissolved substances in parts per million (ppm)		
		oxygen	nitrate	phosphate
1	Heavily populated industrial area; water is heavily polluted	0.01	22.3	18.8
2	A small fishing village; small population	4.0	3.2	2.8
3	A small bay surrounded by cleared land used for agriculture	2.0	14.5	17.9
4	A river that runs through the most forested, protected area shown	8.0	2.1	1.9

32. The presence of high densities of some species, such as sludge worms, indicates that a site is polluted. At which of the sites would you most likely find a high density of sludge worms?

✔ A. Sites 1 and 3

B. Sites 2 and 4

C. Sites 3 and 4

D. Sites 1 and 4

Reporting Category/Subcategory for Item 32: ***Inquiry*/Analysis and Interpretation of Data (p. 256)**

33. A major negative impact of the use of fossil fuels by industry is

    A. reduced productivity.

    B. increased unemployment.

✔ C. formation of acid rain.

    D. increased noise pollution.

Reporting Category/Subcategory for Item 33: ***Technology*/Science, Technology, and Human Affairs (p. 262)**

34. In guinea pigs, black coat color (B) is dominant over white (b). Two black guinea pigs are mated. Most of the offspring are black but some are white. The ratio of black-coated offspring to white-coated offspring was 3:1. In this cross, the parental genotypes were **most likely**

    A. BB × bb.

✔ B. Bb × Bb.

    C. Bb × bb.

    D. BB × Bb.

Reporting Category/Subcategory for Item 34: ***Life Sciences*/Heredity and Evolution (pp. 258-259)**

35. CAM refers to Computer-Aided Manufacturing. It is the process of using computers to

✔ A. control machines.

    B. make drawings and designs.

    C. store information about raw materials and parts as well as drawings and designs.

    D. ensure timely arrival of raw materials and purchased parts to factories.

Reporting Category/Subcategory for Item 35: ***Technology*/Understanding and Using Technology (pp. 261-262)**

36. A mechanic uses a block and tackle to lift an engine out of a car. The engine weighs 3,000 newtons and is lifted 2 meters. How many newton-meters (Nm) of work are done during this process?

A. 1,500 Nm

B. 3,000 Nm

C. 4,500 Nm

✔ D. 6,000 Nm

Reporting Category/Subcategory for Item 36: ***Physical Sciences*/Position and Motion of Objects (p. 257)**

37. Cold packs are used for treating many injuries. You can make a cold pack by adding two heaping tablespoons of KI to a plastic bag containing water, sealing the bag, and then shaking it. Which of the following expressions best describes the transformation that occurs?

✔ A. KI + water + heat → cold solution

B. KI + water → cold solution + heat

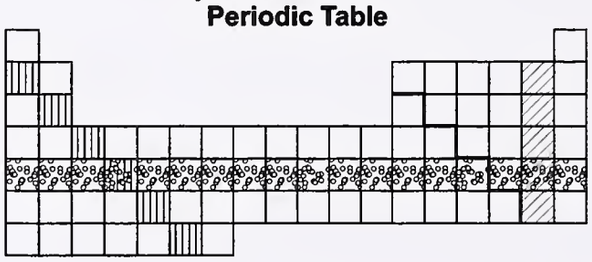
C. KI – heat → cold solution

D. KI + cold solution → heat + water

Reporting Category/Subcategory for Item 37: ***Physical Sciences*/Structure of Matter (pp. 256-257)**

Use the representation of the periodic table below to answer question 38.

Representation of the Periodic Table



38. Which group of elements in the representation of the periodic table would have similar chemical properties?

A.

B.

✔ C.

D.

Reporting Category/Subcategory for Item 38: ***Physical Sciences*/Interactions of Substances (p. 257)**

Use the information in the box below to answer question 39.

Newton described the gravitational attraction between two objects using the mathematical equation

$$F = \frac{Gm_1m_2}{r^2}$$

39. When the distance (r) between the two objects remains constant, but only one of the masses is doubled, the force of gravitational attraction will be

A. the same.

✔ B. twice as much.

C. one-half as much.

D. one-fourth as much.

Reporting Category/Subcategory for Item 39: ***Earth and Space Sciences*/Earth's Processes (pp. 259-260)**

40. According to Newton, a force may cause an object to do all of the following **except**

✔ A. gain mass.

B. slow down.

C. speed up.

D. change shape.

Reporting Category/Subcategory for Item 40: ***Physical Sciences*/Position and Motion of Objects (p. 257)**

Session 3, Open-Response Questions

41. If you place a wilted lettuce leaf in a pan of tap water for an hour, the lettuce leaf will become crisp again. Explain in detail why this occurs. Be sure to include the terms hypotonic, osmosis, central vacuole, cell wall, and turgor pressure in your explanation.

Reporting Category/Subcategory for Item 41: ***Life Sciences*/Characteristics of Organisms (p. 258)**

Use the map and table below to answer question 42.

Soil Maps

Below you will find a simplified soil map and a table describing the soils marked on the map. Use this information to answer the following question.

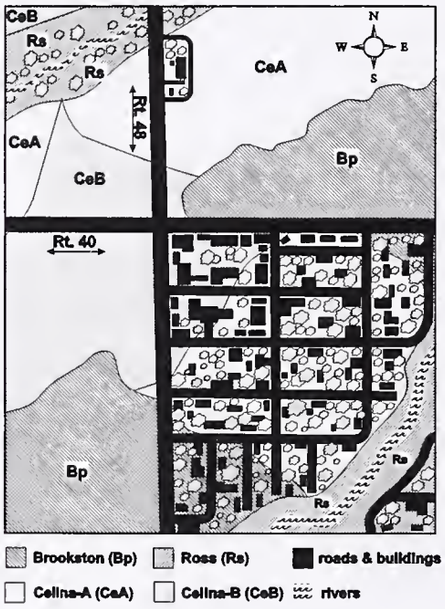


TABLE 1

	Brookston (Bp)	Colina-A (CeA)	Colina-B (CeB)	Ross (Rs)
Drainage/runoff in soil	poorly drained; (water drains slowly into soil)	runoff is slow	runoff is medium fast	well drained; (water drains quickly into soil)
Limitation for:				
farming	severe; seasonally high water	slight	slight	severe; frequent flooding
homesite	severe; seasonally high water	slight	moderate; subject to erosion	severe; frequent flooding
construction of streets	severe; seasonally high water	slight	moderate; subject to erosion	severe; frequent flooding
parks, play areas	moderate; seasonally high water	slight	moderate; subject to erosion	severe; frequent flooding

The words *slight, moderate,* and *severe* refer to the limitations of the soil that affect the specified use.

Slight indicates soil properties are suitable for the specified use.

Moderate indicates soil properties are unfavorable for the specified use, but can be overcome or minimized by special planning and design.

Severe indicates that soil properties are unfavorable or difficult for the specified use, and that a major increase in construction effort, special design, or intensive maintenance is required.

42. Assume you are a member of the city commission that will decide where to locate a new landfill. Based on location and soil characteristics of all the available land on the map, explain where you would locate the new landfill and why.

Reporting Category/Subcategory for Item 42: ***Inquiry*/Analysis and Interpretation of Data (p. 256)**

XI. History and Social Science,

Grade 8

History and Social Science, Grade 8

The spring 2000 MCAS History and Social Science test was based on the learning standards and core knowledge topics of the Massachusetts *History and Social Science Curriculum Framework* (1997). Each test question assessed students' knowledge, concepts, and reasoning related to a specific learning standard; most questions also assessed knowledge, concepts, and reasoning related to a particular core knowledge topic.

Curriculum Framework *Learning Standards*

The *Framework* identifies four major study strands:

- History
- Geography
- Economics
- Civics and Government

The learning standards for each study strand are listed below and are directly quoted from the *Framework;* applicable *Framework* page numbers are shown in parentheses.

History (*Framework,* pp. 64–65, 74–75, 78–93)

1. **Chronology and Cause.** Students will understand the chronological order of historical events and recognize the complexity of historical cause and effect, including the interaction of forces from different spheres of human activity, the importance of ideas, and of individual choices, actions, and character.

2. **Historical Understanding.** Students will understand the meaning, implications, and import of historical events, while recognizing the contingency and unpredictability of history—how events could have taken other directions—by studying past ideas as they were thought, and past events as they were lived, by people of the time.

3. **Research, Evidence, and Point of View.** Students will acquire the ability to frame questions that can be answered by historical study and research; to collect, evaluate, and employ information from primary and secondary sources, and to apply it in oral and written presentations. They will understand the many kinds and uses of evidence; and by comparing competing historical narratives, they will differentiate historical fact from historical interpretation and from fiction.

4. **Society, Diversity, Commonality, and the Individual.** As a vast nation, the overwhelming majority of whose population derives from waves of immigration from many lands, the United States has a citizenry that exhibits a broad diversity in terms of race, ethnic traditions, and religious beliefs. The history of the United States exhibits perhaps the most important endeavor to establish a civilization founded on the principles that all people are created equal, that it is the purpose of government to secure the inalienable rights of all individuals, and that government derives "its just powers from the consent of the governed." It is also true, however, that federal, state, and local governments, as well as the people themselves, have often fallen short in practice of actualizing these high ideals, the most egregious violation being the acceptance of slavery in some states until the Civil War. Students should be expected to learn of the complex interplay that has existed from the beginning of our country between American ideals and American practice in the pursuit of realizing the goals of the Declaration of Independence for all people. While attending to the distinct contributions that immigrants from various lands and of various creeds, along with Native Americans, have made to our nationhood, students [will understand] above all the importance of our common citizenship and the imperative to treat all individuals with the respect for their dignity called for by the Declaration of Independence.

5. **Interdisciplinary Learning: Religion, Ethics, Philosophy, and Literature in History.** Students will describe and explain fundamental tenets of major world religions; basic ideals of ethics, including justice, consideration for others, and respect for human rights; differing conceptions of human nature; and influences over time of religion, ethics, and ideas of human nature in the arts, political and economic theories and ideologies, societal norms, education of the public, and the conduct of individual lives.

6. **Interdisciplinary Learning: Natural Science, Mathematics, and Technology in History.** Students will describe and explain major advances, discoveries, and inventions over time in natural science, mathematics, and technology; explain some of their effects and influences in the past and present on human life, thought, and health, including use of natural resources, production and distribution and consumption of goods, exploration, warfare, and communication.

Geography (*Framework*, pp. 66–67, 75, 94–101)

7. **Physical Spaces of the Earth.** Students will describe earth's natural features and their physical and biological characteristics; they will be able to visualize and map oceans and continents; mountain chains and rivers; forest, plain, and desert; resources both above and below ground; and conditions of climate and seasons.

8. **Places and Regions of the World.** Students will identify and explain the location and features of places and systems organized over time, including boundaries of nations and regions; cities and towns; capitals and commercial centers; roads, rails, and canals; dams, harbors, and fortifications; and routes of trade and invasion.

9. **The Effects of Geography.** Students will learn how physical environments have influenced particular cultures, economies, and political systems, and how geographic factors have affected population distribution, human migration, and other prehistoric and historical developments, such as agriculture, manufacturing, trade, and transportation.

10. **Human Alteration of Environments.** Students will describe the ways in which human activity has changed the world, such as removing natural barriers; transplanting some animal and plant species, and eliminating others; increasing or decreasing the fertility of land; and the mining of resources. They explain how science, technology, and institutions of many kinds have affected human capacity to alter environments.

Economics (*Framework*, pp. 68–71, 75–76, 102–117)

11. **Fundamental Economic Concepts.** Students will understand fundamental economic concepts, including choice, ownership, exchange, cooperation, competition, purposive effect, entrepreneurship, incentive, and money.

12. **Economic Reasoning.** Students will demonstrate understanding of supply and demand, price, labor markets, the costs of capital, factors affecting production, distribution, and consumption, relations among such factors, the nature of goods and services, incentives, financial markets, cost-benefit (including marginal cost-benefit) analysis, fairness, and the value of trade.

13. **American and Massachusetts Economic History.** Students will describe the development of the American economy, including Massachusetts and New England, from colonial times to the present.

14. **Today's Economy.** Students will describe the distinctive aspects of the contemporary economy of the United States and the world.

15. **Theories of Economy.** Students will describe and compare the major theories of economy, and will identify the individuals and historical circumstances in which these theories were developed.

Civics and Government *(Framework,* pp. 72–73, 76–77, 118–130)

16. **Authority, Responsibility, and Power.** Students will explain forms of authority in government and other institutions; explain purposes of authority and distinguish authority from mere power, as in "a government of laws, but not of men"; and describe responsible and irresponsible exercise of both authority and power.

17. **The Founding Documents.** Students will learn in progressively greater detail the content and history of the Founding Documents of the United States—the Declaration of Independence, United States Constitution, and selected *Federalist* papers (as required by the Massachusetts Education Reform Act of 1993). They will assess the reasoning, purposes, and effectiveness of the documents; and, similarly, elements of the Constitution of the Commonwealth of Massachusetts.

18. **Principles and Practices of American Government.** Students will describe how the United States government functions at the local, state, national, and international levels, with attention to the Constitution of the Commonwealth of Massachusetts, its Declaration of the Rights of the Inhabitants, and the basic elements of its Frame of Government; analyze the background and evolution of constitutional and democratic government in the United States to the present day; and explain the place of institutions of government in securing the rights of citizens.

19. **Citizenship.** Students will learn the rights and duties of citizens and the principle of equal rights for all; consider the nature of civic virtue in a school, a community, a nation; and identify major obstacles and threats to civil rights.

20. **Forms of Government.** Students will study, compare, contrast, and analyze diverse forms of government; the ways of life and opportunities they permit, promote, and prohibit; and their effects on human rights. They will evaluate forms of government in terms of justice, ordered liberty, efficiency, public safety, educational opportunity, and economic and social mobility.

Curriculum Framework *Core Knowledge Topics*

The *History and Social Science Curriculum Framework* groups core knowledge topics into two categories: **The United States** and **The World,** and recommends a scope and sequence of instruction. In accordance with the *Framework's* recommendations, MCAS tests grade 8 students on core knowledge topics from both categories, as listed below; however, no single annual MCAS administration will test **all** core knowledge topics from the grade 8 list.

Core knowledge topics are primarily assessed through questions linked with *History* strand learning standards. Each MCAS test item based on a *History* strand learning standard also assesses a core knowledge topic. Questions based on *Geography, Economics,* or *Civics and Government* strand learning standards are not necessarily linked to a core knowledge topic; those that assess only a learning standard are considered "stand alone" items.

Questions within any single test session covered up to two core knowledge topic eras; these questions were not necessarily presented in chronological order. However, the sequence of questions from session to session generally progressed in chronological order by era.

The grade 8 History and Social Science core knowledge topics listed below are directly quoted from pages 13, 14, and 16 of the *Framework;* each topic is further subdivided on those *Framework* pages. Pages 24-50 of the *Framework* additionally list commonly taught subtopics for grade 8 students.

Grade 8 Core Knowledge Topics: The United States

1. Early America and the Americans (Beginnings to 1650)
2. Settlements, Colonies, and Emerging American Identity (1600 to 1763)
3. The American Revolution: Creating a New Nation (1750 to 1815)
4. Expansion, Reform, and Economic Growth (1800 to 1861)
5. The Civil War and Reconstruction (1850 to 1877)

The World

1. Human Beginnings and Early Civilizations (Prehistory to 1000 B.C.)
2. Classical Civilizations of the Ancient World (1000 B.C. to c. 500 A.D.)
3. Growth of Agricultural and Commercial Civilizations (500 to 1500 A.D.)[27]

MCAS Reporting Categories

In *Test Item Analysis Reports* and on the *Subject Area Subscore* pages of the MCAS *School* and *District Reports,* grade 8 History and Social Science test results are reported under the following five MCAS reporting categories:

- *U.S. History*
- *World History*
- *Geography*
- *Economics*
- *Civics and Government*

[27] Grade 8 students are tested only on the first three subdivisions listed in the *Framework* under this core knowledge topic.

MCAS Spring 2000 Common Test Items History and Social Science, Grade 8

Test Sessions

MCAS grade 8 History and Social Science Student Test Booklets included 3 separate test sessions. Each session included multiple-choice and open-response questions.

Reference Materials and Tools

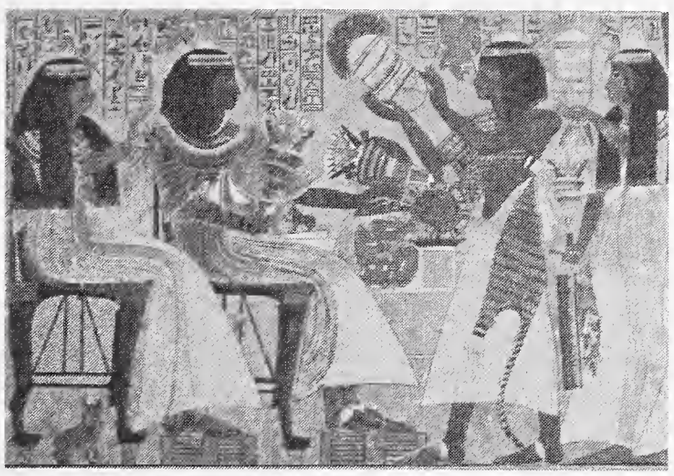
No reference materials or tools were allowed during any History and Social Science test session.

Cross-Reference Information

The shaded bar underneath each item indicates the item's MCAS reporting category, the *Framework* learning standard it assesses, and the core knowledge topic assessed by the item, if any. Items that do not assess a core knowledge topic ("stand alone" items) indicate "NA" ("Not Applicable") in the appropriate line of their shaded bars. The page numbers given in parentheses indicate where in this document to locate the referenced learning standard and, if applicable, core knowledge topic.

Session 1, Multiple-Choice Questions

Study the photograph below of an ancient painting to answer question 1.



1. In which location did archaeologists **most likely** find the ancient painting shown?

✔ A. the burial vault of an Egyptian pyramid

B. a Roman home preserved by volcanic ash

C. the side of a sunken Chinese trading ship

D. the ruins of a Greek marketplace

Item 1
Reporting Category/Learning Standard: ***World History*/Historical Understanding (p. 285)**
Core Knowledge Topic: **Human Beginnings and Early Civilizations (Prehistory to 1000 B.C.) (p. 289)**

2. Late Paleolithic hunters adapted to the spread of glaciers in northern latitudes by

A. herding animals into rock shelters.

B. creating large, organized communities.

C. planting crops for food.

✔ D. using animal hides and fur for clothing.

Item 2
Reporting Category/Learning Standard: ***Geography*/The Effects of Geography (p. 287)**
Core Knowledge Topic: **Human Beginnings and Early Civilizations (Prehistory to 1000 B.C.) (p. 289)**

3. The Roman Empire differed in important ways from the Roman Republic. Which statement best describes one of the differences?

   A. Political power was primarily held by the citizens during the Roman Empire.

   B. Only the Roman Empire had colonies.

✔ C. Political power was primarily held by one person during the Roman Empire.

   D. Only the Roman Empire had a powerful Senate.

Item 3
Reporting Category/Learning Standard: ***World History*/Historical Understanding (p. 285)**
Core Knowledge Topic: **Classical Civilizations of the Ancient World (1000 B.C. to c. 500 A. D.) (p. 289)**

4. A person living in ancient Mesopotamia could have seen all of the following **except**

   A. people using a calendar.

✔ B. an aqueduct.

   C. writing on a tablet.

   D. a cart with wheels.

Item 4
Reporting Category/Learning Standard: ***World History*/Interdisciplinary Learning: Natural Science, Mathematics, and Technology in History (p. 286)**
Core Knowledge Topic: **Human Beginnings and Early Civilizations (Prehistory to 1000 B.C.) (p. 289)**

5. The basic laws of conduct for Judaism and Christianity are found within the

   A. Code of Hammurabi.

   B. Gospel of Luke.

   C. Eightfold Path.

✔ D. Ten Commandments.

Item 5
Reporting Category/Learning Standard: ***World History*/Interdisciplinary Learning: Religion, Ethics, Philosophy, and Literature in History (p. 286)**
Core Knowledge Topic: **Classical Civilizations of the Ancient World (1000 B.C. to c. 500 A. D.) (p. 289)**

6. The way work is done on an assembly line is an example of

   A. capital resources.

✔ B. division of labor.

   C. supply and demand.

   D. products and services.

Item 6
Reporting Category/Learning Standard: ***Economics*/Fundamental Economic Concepts (p. 287)**
Core Knowledge Topic: **NA**

Study the map on the right to answer question 7.

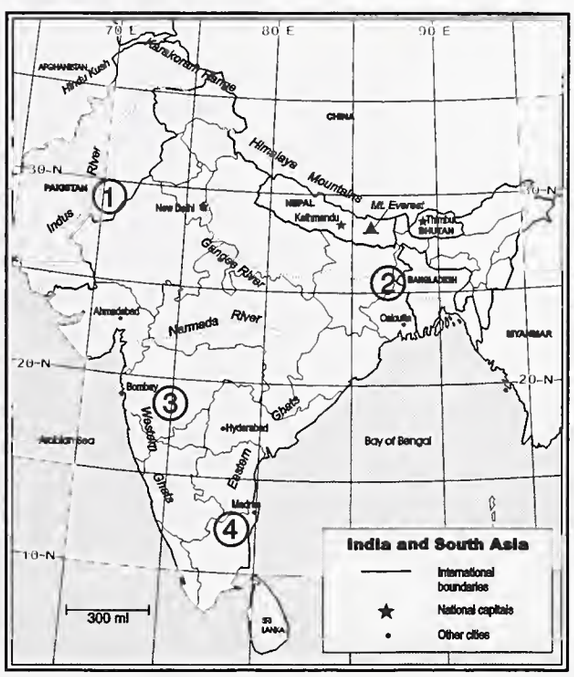
7. Which number on the map labels the region of India's earliest known civilization?

✔ A. 1

   B. 2

   C. 3

   D. 4



Item 7
Reporting Category/Learning Standard: ***Geography*/Places and Regions of the World (p. 287)**
Core Knowledge Topic: **Human Beginnings and Early Civilizations (Prehistory to 1000 B.C.) (p. 289)**

8. The ancient civilization that practiced an early form of democracy was located in

   A. Egypt.

   B. Mesopotamia.

✔ C. Greece.

   D. Mali.

Item 8
Reporting Category/Learning Standard: ***World History*/Historical Understanding (p. 285)**
Core Knowledge Topic: **Classical Civilizations of the Ancient World (1000 B.C. to c. 500 A. D.) (p. 289)**

Refer to the map below to answer question 9.

9. Which country listed below has the largest land area?

✔ A. Russia

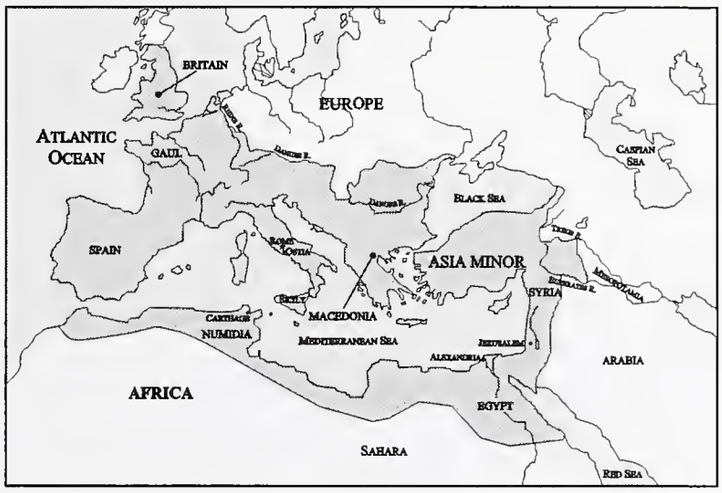
   B. Mexico

   C. Canada

   D. Australia

Item 9
Reporting Category/Learning Standard: ***Geography*/Places and Regions of the World (p. 287)**
Core Knowledge Topic: **NA**

Study the map below to answer question 10.



10. What would be the **best** title for this map?

A. The Egyptian Empire 1350 B.C.

B. Alexander the Great's Empire 323 B.C.

✔ C. The Roman Empire A.D. 117

D. Charlemagne's Empire A.D. 800

Item 10
Reporting Category/Learning Standard: ***World History*/Historical Understanding (p. 285)**
Core Knowledge Topic: **Classical Civilizations of the Ancient World (1000 B.C. to c. 500 A. D.) (p. 289)**

11. A pharaoh's authority to rule in ancient Egypt came from which source?

✔ A. a belief that he was a god

B. his building of pyramids and other religious sites

C. his ability to control the flooding of the Nile

D. a set of laws written by high priests

Item 11
Reporting Category/Learning Standard: ***World History*/Historical Understanding (p. 285)**
Core Knowledge Topic: **Human Beginnings and Early Civilizations (Prehistory to 1000 B.C.) (p. 289)**

12. Hinduism, Buddhism, and Confucianism all originated on which continent?

A. South America

B. Europe

C. Africa

✔ D. Asia

Item 12

Reporting Category/Learning Standard: ***World History*/Interdisciplinary Learning: Religion, Ethics, Philosophy, and Literature in History (p. 286)**

Core Knowledge Topic: **Classical Civilizations of the Ancient World (1000 B.C. to c. 500 A. D.) (p. 289)**

Session 1, Open-Response Questions

13. From the list below, select **two** aspects of life in the Roman Empire and discuss how each has influenced politics, culture, **or** economics in the United States.

- architecture
- art
- government
- language
- law
- literature
- mathematics
- philosophy
- religion
- science

Item 13
Reporting Category/Learning Standard: ***World History*/Chronology and Cause (p. 285)**
Core Knowledge Topic: **Classical Civilizations of the Ancient World (1000 B.C. to c. 500 A. D.) (p. 289)**

14. A historian is researching life in the South before the Civil War. She is using two sources.

    a. "Source A" is the written record of a series of interviews with ex-slaves done in the 1930s by a university's oral history project. Describe **one** advantage and **one** disadvantage of "Source A" to the historian's research.

    b. "Source B" is the diary of the wife of a South Carolina plantation owner, written between 1840 and 1850. Describe **one** advantage and **one** disadvantage of "Source B" to the historian's research.

Item 14
Reporting Category/Learning Standard: ***U.S. History*/Research, Evidence, and Point of View (p. 286)**
Core Knowledge Topic: **Expansion, Reform, and Economic Growth (1800 to 1861) (p. 289)**

Session 2, Multiple-Choice Questions

15. Before the American Revolution, many colonists refused to buy British goods. Their refusal to buy these goods was called a

✔ A. boycott.

B. filibuster.

C. monopoly.

D. blockade.

Item 15
Reporting Category/Learning Standard: Economics/**Fundamental Economic Concepts (p. 287)**
Core Knowledge Topic: **The American Revolution: Creating a New Nation (1750 to 1815) (p. 289)**

16. In 1492, Christopher Columbus was seeking a new route to what is now called

A. Cuba.

B. Brazil.

✔ C. Asia.

D. Africa.

Item 16
Reporting Category/Learning Standard: U.S. History/**Historical Understanding (p. 285)**
Core Knowledge Topic: **Early America and the Americans (Beginnings to 1650) (p. 289)**

17. During the seventeenth century, all of the European powers below competed to establish empires in the Americas **except**

A. Spain.

B. France.

C. England.

✔ D. Italy.

Item 17
Reporting Category/Learning Standard: U.S. History/**Historical Understanding (p. 285)**
Core Knowledge Topic: **Settlements, Colonies, and Emerging, American Identity (1600 to 1763) (p. 289)**

18. The term "the Middle Passage" refers to the

A. condition of African Americans freed after the Civil War.

✔ B. transport of slaves from Africa to the Americas.

C. life of free African Americans in the North and in Canada.

D. escape from slavery on the Underground Railroad.

Item 18
Reporting Category/Learning Standard: ***U.S. History*/Historical Understanding (p. 285)**
Core Knowledge Topic: **Early America and the Americans (Beginnings to 1650) (p. 289)**

19. New England's economy **before** the American Revolution was based primarily upon

A. whaling.

✔ B. small farms.

C. large plantations.

D. manufacturing.

Item 19
Reporting Category/Learning Standard: ***Economics*/American and Massachusetts Economic History (p. 287)**
Core Knowledge Topic: **Settlements, Colonies, and Emerging American Identity (1600 to 1763) (p. 289)**

20. Which of the following statements about civil rights in the United States is **not** true?

✔ A. Juveniles and adults have all the same rights.

B. The government can restrict civil rights in times of war.

C. Peaceful protests about government policy are permitted.

D. The Supreme Court can interpret the meaning of civil rights.

Item 20
Reporting Category/Learning Standard: ***Civics and Government*/Citizenship (p. 288)**
Core Knowledge Topic: **NA**

21. All the following are examples of the United States constitutional system of *checks and balances* except

A. the president's power to veto bills passed by Congress.

B. Congress's power to impeach and remove the president.

C. the Supreme Court's power to declare federal laws unconstitutional.

✔ D. the president's power to remove judges from office.

Item 21
Reporting Category/Learning Standard: ***Civics and Government*/Principles and Practices of American Government (p. 288)**
Core Knowledge Topic: **NA**

22. According to the English philosopher John Locke, an important purpose of government is to

A. distribute property equally among citizens.

B. protect the established church.

✔ C. protect life, liberty, and property.

D. guarantee freedom of religion.

Item 22
Reporting Category/Learning Standard: ***Civics and Government*/The Founding Documents (p. 288)**
Core Knowledge Topic: **Settlements, Colonies, and Emerging American Identity (1600 to 1763) (p. 289)**

23. By 1770, the dominant European power on the east coast of North America was

A. Spain.

✔ B. England.

C. Holland.

D. France.

Item 23
Reporting Category/Learning Standard: ***U.S. History*/Historical Understanding (p. 285)**
Core Knowledge Topic: **The American Revolution: Creating a New Nation (1750 to 1815) (p. 289)**

24. One important reason Anti-Federalists opposed adopting the United States Constitution was because they feared it would

    A. reduce the power of the national government.

    B. not give enough authority to the president.

✔ C. not include a guarantee of individual rights.

    D. increase the power of the state governments.

Item 24
Reporting Category/Learning Standard: ***Civics and Government*/The Founding Documents (p. 288)**
Core Knowledge Topic: **The American Revolution: Creating a New Nation (1750 to 1815) (p. 289)**

25. Which of the following people was the **first** to serve as a United States president?

    A. Andrew Jackson

    B. James Polk

    C. James Monroe

✔ D. John Adams

Item 25
Reporting Category/Learning Standard: ***U.S. History*/Chronology and Cause (p. 285)**
Core Knowledge Topic: **The American Revolution: Creating a New Nation (1750 to 1815) (p. 289)**

Session 2, Open-Response Questions

26. The events listed below occurred in the early history of the United States.

- Shays' Rebellion, 1787
- Louisiana Purchase, 1803
- Monroe Doctrine, 1823

a. Select **one** of the events and describe the event. Be sure to include specific historic details.
b. Fully explain what effects/consequences this event had.

Item 26
Reporting Category/Learning Standard: ***U.S. History*/Chronology and Cause (p. 285)**
Core Knowledge Topic: **The American Revolution: Creating a New Nation (1750 to 1815) (p. 289)**

27. The people listed below were inventors or scientists. Choose **one** of the people listed and answer parts a and b.

- Benjamin Banneker
- Robert Fulton
- Benjamin Franklin

a. Describe what contributions the individual made.
b. Explain how these contributions changed people's lives.

Item 27
Reporting Category/Learning Standard: ***U.S. History*/Interdisciplinary Learning: Natural Science, Mathematics, and Technology in History (p. 286)**
Core Knowledge Topic: **Expansion, Reform, and Economic Growth (1800 to 1861) (p. 289)**

Session 3, Multiple-Choice Questions

The statement below was made by a United States president.[28] *Read and think about it to answer question 28.*

> A house divided against itself cannot stand. I believe this government cannot exist, half slave and half free.

28. Which president made this statement?

A. George Washington

B. Andrew Jackson

✔ C. Abraham Lincoln

D. Andrew Johnson

Item 28
Reporting Category/Learning Standard: ***U.S. History*/Research, Evidence, and Point of View (p. 286)**
Core Knowledge Topic: **The Civil War and Reconstruction (1850 to 1877) (p. 289)**

29. Before the 1850s, steam power was **most** important to the development of

A. canals.

✔ B. railroads.

C. bridges.

D. roads.

Item 29
Reporting Category/Learning Standard: ***U.S. History*/Interdisciplinary Learning: Natural Science, Mathematics, and Technology in History (p. 286)**
Core Knowledge Topic: **Expansion, Reform, and Economic Growth (1800 to 1861) (p. 289)**

[28] This quotation was simplified for use on the test. The actual quote is "'A house divided against itself cannot stand.' I believe this government cannot endure permanently, half-slave and half-free."

30. The building of the Erie Canal helped to

✔ A. link the Atlantic coast to the midwest for trade.

B. provide jobs for Chinese immigrants.

C. provide passage for slaves seeking freedom.

D. bring fresh water to New York City.

Item 30
Reporting Category/Learning Standard: ***Economics*/American and Massachusetts Economic History (p. 287)**
Core Knowledge Topic: **NA**

31. President Andrew Jackson was involved in all of the following **except**

A. the spoils system.

B. confronting South Carolina's tariff nullification.

✔ C. the Mexican War.

D. vetoing a bill to recharter the Bank of the United States.

Item 31
Reporting Category/Learning Standard: ***U.S. History*/Historical Understanding (p. 285)**
Core Knowledge Topic: **Expansion, Reform, and Economic Growth (1800 to 1861) (p. 289)**

32. The decision in *Marbury v. Madison* (1803) established the

A. Supreme Court's right to regulate interstate commerce.

B. right of states to regulate private contracts.

C. right of states to oversee education.

✔ D. Supreme Court's right to overturn federal laws.

Item 32
Reporting Category/Learning Standard: ***Civics and Government*/Principles and Practices of American Government (p. 288)**
Core Knowledge Topic: **Expansion, Reform, and Economic Growth (1800 to 1861) (p. 289)**

33. Which continent is the smallest in land area?

A. South America

✔ B. Australia

C. Antarctica

D. North America

Item 33
Reporting Category/Learning Standard: ***Geography*/Physical Spaces of the Earth (p. 287)**
Core Knowledge Topic: **NA**

34. In the 1840s, a growing number of Americans wanted to acquire California from Mexico because they

A. believed its climate would be beneficial for health.

B. were afraid that Canada would try to establish a colony there.

✔ C. wanted the United States to extend to the Pacific Ocean.

D. knew it contained vast amounts of coal and iron ore.

Item 34
Reporting Category/Learning Standard: ***U.S. History*/Historical Understanding (p. 285)**
Core Knowledge Topic: **Expansion, Reform, and Economic Growth (1800 to 1861) (p. 289)**

35. All the following were political parties in the United States before the Civil War except

A. Whigs.

B. Free Soilers.

C. Democrats.

✔ D. Knights of Labor.

Item 35
Reporting Category/Learning Standard: ***U.S. History*/Historical Understanding (p. 285)**
Core Knowledge Topic: **Expansion, Reform, and Economic Growth (1800 to 1861) (p. 289)**

36. In the 1840s, the greatest number of immigrants to the United States came from

✔ A. Europe.

B. Asia.

C. South America.

D. Australia.

Item 36
Reporting Category/Learning Standard: ***Geography*/The Effects of Geography (p. 287)**
Core Knowledge Topic: **NA**

37. Of the following, the first member of the Republican Party to be elected president of the United States was

A. Andrew Jackson.

✔ B. Abraham Lincoln.

C. Ulysses S. Grant.

D. James Polk.

Item 37
Reporting Category/Learning Standard: ***U.S. History*/Historical Understanding (p. 285)**
Core Knowledge Topic: **The Civil War and Reconstruction (1850 to 1877) (p. 289)**

Use the map below to answer question 38.

38. Which number on the map labels the state that first seceded from the Union?

A. 1

B. 2

C. 3

✔ D. 4

Item 38
Reporting Category/Learning Standard: ***Geography*/Places and Regions of the World (p. 287)**
Core Knowledge Topic: **The Civil War and Reconstruction (1850 to 1877) (p. 289)**

Session 3, Open-Response Question

39. As Americans moved westward in the 1800s, they encountered many geographic barriers. Discuss three major geographic barriers settlers encountered as they traveled by land and/or by sea on their way to California from the East Coast. Describe each barrier in detail and tell where it was found.

Item 39
*Reporting Category/*Learning Standard: ***Geography/*The Effects of Geography (p. 287)**
Core Knowledge Topic: **Expansion, Reform, and Economic Growth (1800 to 1861) (p. 289)**

XII. History and Social Science,

Grade 10

History and Social Science, Grade 10

The spring 2000 MCAS History and Social Science test was based on the learning standards and core knowledge topics of the Massachusetts *History and Social Science Curriculum Framework* (1997). Each test question assessed students' knowledge, concepts, and reasoning related to a specific learning standard; most questions also assessed knowledge, concepts, and reasoning related to a particular core knowledge topic.

Curriculum Framework *Learning Standards*

The *Framework* identifies four major study strands:

- History
- Geography
- Economics
- Civics and Government

The learning standards for each study strand are listed below and are directly quoted from the *Framework;* applicable *Framework* page numbers are shown in parentheses.

History (*Framework,* pp. 64–65, 74–75, 78–93)

1. **Chronology and Cause.** Students will understand the chronological order of historical events and recognize the complexity of historical cause and effect, including the interaction of forces from different spheres of human activity, the importance of ideas, and of individual choices, actions, and character.

2. **Historical Understanding.** Students will understand the meaning, implications, and import of historical events, while recognizing the contingency and unpredictability of history—how events could have taken other directions—by studying past ideas as they were thought, and past events as they were lived, by people of the time.

3. **Research, Evidence, and Point of View.** Students will acquire the ability to frame questions that can be answered by historical study and research; to collect, evaluate, and employ information from primary and secondary sources, and to apply it in oral and written presentations. They will understand the many kinds and uses of evidence; and by comparing competing historical narratives, they will differentiate historical fact from historical interpretation and from fiction.

4. **Society, Diversity, Commonality, and the Individual.** As a vast nation, the overwhelming majority of whose population derives from waves of immigration from many lands, the United States has a citizenry that exhibits a broad diversity in terms of race, ethnic traditions, and religious beliefs. The history of the United States exhibits perhaps the most important endeavor to establish a civilization founded on the principles that all people are created equal, that it is the purpose of government to secure the inalienable rights of all individuals, and that government derives "its just powers from the consent of the governed." It is also true, however, that federal, state, and local governments, as well as the people themselves, have often fallen short in practice of actualizing these high ideals, the most egregious violation being the acceptance of slavery in some states until the Civil War. Students should be expected to learn of the complex interplay that has existed from the beginning of our country between American ideals and American practice in the pursuit of realizing the goals of the Declaration of Independence for all people. While attending to the distinct contributions that immigrants from various lands and of various creeds, along with Native Americans, have made to our nationhood, students [will understand] above all the importance of our common citizenship and the imperative to treat all individuals with the respect for their dignity called for by the Declaration of Independence.

5. **Interdisciplinary Learning: Religion, Ethics, Philosophy, and Literature in History.** Students will describe and explain fundamental tenets of major world religions; basic ideals of ethics, including justice, consideration for others, and respect for human rights; differing conceptions of human nature; and influences over time of religion, ethics, and ideas of human nature in the arts, political and economic theories and ideologies, societal norms, education of the public, and the conduct of individual lives.

6. **Interdisciplinary Learning: Natural Science, Mathematics, and Technology in History.** Students will describe and explain major advances, discoveries, and inventions over time in natural science, mathematics, and technology; explain some of their effects and influences in the past and present on human life, thought, and health, including use of natural resources, production and distribution and consumption of goods, exploration, warfare, and communication.

Geography (*Framework,* pp. 66–67, 75, 94–101)

7. **Physical Spaces of the Earth.** Students will describe earth's natural features and their physical and biological characteristics; they will be able to visualize and map oceans and continents; mountain chains and rivers; forest, plain, and desert; resources both above and below ground; and conditions of climate and seasons.
8. **Places and Regions of the World.** Students will identify and explain the location and features of places and systems organized over time, including boundaries of nations and regions; cities and towns; capitals and commercial centers; roads, rails, and canals; dams, harbors, and fortifications; and routes of trade and invasion.
9. **The Effects of Geography.** Students will learn how physical environments have influenced particular cultures, economies, and political systems, and how geographic factors have affected population distribution, human migration, and other prehistoric and historical developments, such as agriculture, manufacturing, trade, and transportation.
10. **Human Alteration of Environments.** Students will describe the ways in which human activity has changed the world, such as removing natural barriers; transplanting some animal and plant species, and eliminating others; increasing or decreasing the fertility of land; and the mining of resources. They explain how science, technology, and institutions of many kinds have affected human capacity to alter environments.

Economics (*Framework,* pp. 68–71, 75–76, 102–117)

11. **Fundamental Economic Concepts.** Students will understand fundamental economic concepts, including choice, ownership, exchange, cooperation, competition, purposive effect, entrepreneurship, incentive, and money.
12. **Economic Reasoning.** Students will demonstrate understanding of supply and demand, price, labor markets, the costs of capital, factors affecting production, distribution, and consumption, relations among such factors, the nature of goods and services, incentives, financial markets, cost-benefit (including marginal cost-benefit) analysis, fairness, and the value of trade.
13. **American and Massachusetts Economic History.** Students will describe the development of the American economy, including Massachusetts and New England, from colonial times to the present.
14. **Today's Economy.** Students will describe the distinctive aspects of the contemporary economy of the United States and the world.
15. **Theories of Economy.** Students will describe and compare the major theories of economy, and will identify the individuals and historical circumstances in which these theories were developed.

Civics and Government *(Framework,* pp. 72–73, 76–77, 118–130)

16. **Authority, Responsibility, and Power.** Students will explain forms of authority in government and other institutions; explain purposes of authority and distinguish authority from mere power, as in "a government of laws, but not of men"; and describe responsible and irresponsible exercise of both authority and power.

17. **The Founding Documents.** Students will learn in progressively greater detail the content and history of the Founding Documents of the United States—the Declaration of Independence, United States Constitution, and selected *Federalist* papers (as required by the Massachusetts Education Reform Act of 1993). They will assess the reasoning, purposes, and effectiveness of the documents; and, similarly, elements of the Constitution of the Commonwealth of Massachusetts.

18. **Principles and Practices of American Government.** Students will describe how the United States government functions at the local, state, national, and international levels, with attention to the Constitution of the Commonwealth of Massachusetts, its Declaration of the Rights of the Inhabitants, and the basic elements of its Frame of Government; analyze the background and evolution of constitutional and democratic government in the United States to the present day; and explain the place of institutions of government in securing the rights of citizens.

19. **Citizenship.** Students will learn the rights and duties of citizens and the principle of equal rights for all; consider the nature of civic virtue in a school, a community, a nation; and identify major obstacles and threats to civil rights.

20. **Forms of Government.** Students will study, compare, contrast, and analyze diverse forms of government; the ways of life and opportunities they permit, promote, and prohibit; and their effects on human rights. They will evaluate forms of government in terms of justice, ordered liberty, efficiency, public safety, educational opportunity, and economic and social mobility.

Curriculum Framework *Core Knowledge Topics*

The *History and Social Science Curriculum Framework* groups core knowledge topics into two categories: **The United States** and **The World,** and recommends a scope and sequence of instruction. In accordance with the *Framework's* recommendations, MCAS tests grade 10 students beginning with the third topic of the core knowledge grouping, The World, as listed below; however, no single annual MCAS administration will test **all** core knowledge topics from the grade 10 list.[29]

Core knowledge topics are primarily assessed through questions linked with *History* strand learning standards. Each MCAS test item based on a *History* strand learning standard also assesses a core knowledge topic. Questions based on *Geography, Economics,* or *Civics and Government* strand learning standards are not necessarily linked to a core knowledge topic; those that assess only a learning standard are considered "stand alone" items.

[29] Any test items about the United States involve the United States as it relates to the "world stage."

Questions within any single test session covered up to two core knowledge topic eras; these questions were not necessarily presented in chronological order. However, the sequence of questions from session to session generally progressed in chronological order by era.

The grade 10 History and Social Science core knowledge topics listed below are directly quoted from pages 16 and 17 of the *Framework;* each topic is further subdivided on those *Framework* pages. Pages 24-50 of the *Framework* additionally list commonly taught subtopics for grade 10 students.

Grade 10 Core Knowledge Topics: The World

3. Growth of Agricultural and Commercial Civilizations (500 to 1500 A.D.)
4. Emergence of a Global Age (1450 to 1750)
5. The Age of Revolutionary Change (1700 to 1914)
6. The World in the Era of Great Wars (1900 to 1945)
7. The World from 1945 to the Present

MCAS Reporting Categories

In *Test Item Analysis Reports* and on the *Subject Area Subscore* pages of the MCAS *School* and *District Reports,* grade 10 History and Social Science test results are reported under the following four MCAS reporting categories:

- *World History*
- *Geography*
- *Economics*
- *Civics and Government*

MCAS Spring 2000 Common Test Items
History and Social Science, Grade 10

Test Sessions

MCAS grade 10 History and Social Science Student Test Booklets included 3 separate test sessions. Each session included multiple-choice and open-response questions.

Reference Materials and Tools

No reference materials or tools were allowed during any History and Social Science test session.

Cross-Reference Information

The shaded bar underneath each item indicates the item's MCAS reporting category, the *Framework* learning standard it assesses, and the core knowledge topic assessed by the item, if any. Items that do not assess a core knowledge topic ("stand alone" items) indicate "NA" ("Not Applicable") in the appropriate line of their shaded bars. The page numbers given in parentheses indicate where in this document to locate the referenced learning standard and, if applicable, core knowledge topic.

Session 1, Multiple-Choice Questions

1. Which of the following is **not** one of the Five Pillars of Islam?

   A. offering prayer five times a day

   B. giving alms

✔ C. being baptized

   D. making a pilgrimage to Mecca

Item 1
Reporting Category/Learning Standard: ***World History*/Interdisciplinary Learning: Religion, Ethics, Philosophy, and Literature in History (p. 312)**
Core Knowledge Topic: **Growth of Agricultural and Commercial Civilizations (500 to 1500 A.D.) (p. 315)**

2. King Henry IV of France issued the Edict of Nantes in 1598 to

   A. end the Hundred Years' War with England.

   B. establish Québec as a French colony.

✔ C. grant religious tolerance to French Protestants (Huguenots).

   D. give the Estates General power to control taxes.

Item 2
Reporting Category/Learning Standard: ***World History*/Interdisciplinary Learning: Religion, Ethics, Philosophy, and Literature in History (p. 312)**
Core Knowledge Topic: **Emergence of a Global Age (1450 to 1750) (p. 315)**

3. The prosperity of the African kingdom of Ghana was based upon its

✔ A. domination of the gold trade.

   B. easy access to sea routes to Arabia.

   C. powerful military forces.

   D. advanced system of roads and canals.

Item 3
Reporting Category/Learning Standard: ***World History*/Historical Understanding (p. 311)**
Core Knowledge Topic: **Growth of Agricultural and Commercial Civilizations (500 to 1500 A.D.) (p. 315)**

4. Which phrase best describes the feudal system in medieval Europe?

   A. the concentration of all political power in the central government

   B. the competition between individual nation-states for supremacy

   C. the collective ownership of land

✔ D. the exchange of service for land

Item 4
Reporting Category/Learning Standard: ***World History*/Historical Understanding (p. 311)**
Core Knowledge Topic: **Growth of Agricultural and Commercial Civilizations (500 to 1500 A.D.) (p. 315)**

5. The Line of Demarcation drawn through South America by the Treaty of Tordesillas (1494) was an attempt by Pope Alexander VI to

   A. control the slave trade.

✔ B. prevent Portugal and Spain from fighting over colonies.

   C. establish a new trade route to the West Indies.

   D. slow down the growth of colonial business and industry.

Item 5
Reporting Category/Learning Standard: ***World History*/Historical Understanding (p. 311)**
Core Knowledge Topic: **Emergence of a Global Age (1450 to 1750 A.D.) (p. 315)**

6. King Henry VIII (1509–1547) is known for leading England's

   A. discovery of the New World.

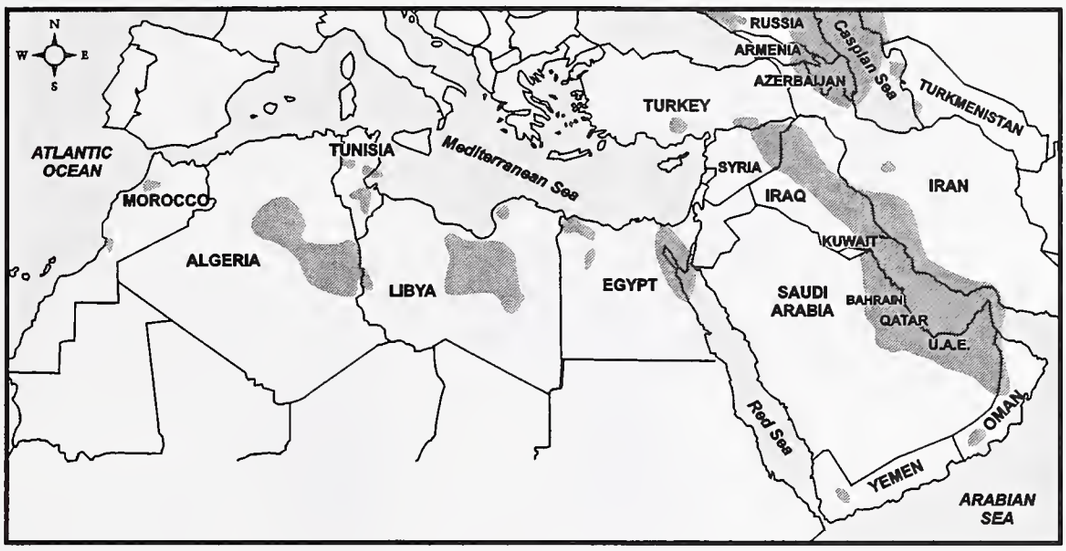
   B. conquest of Poland.

   C. division of Parliament into the Houses of Lords and Commons.

✔ D. separation from the Roman Catholic Church.

Item 6
Reporting Category/Learning Standard: ***World History*/Historical Understanding (p. 311)**
Core Knowledge Topic: **Emergence of a Global Age (1450 to 1750 A.D.) (p. 315)**

Use the map below to answer question 7.



7. All of the shaded areas on the map identify the locations of

   A. flood plains.

✔ B. petroleum resources.

   C. urban areas.

   D. agricultural production centers.

Item 7
Reporting Category/Learning Standard: ***Geography*/Physical Spaces of the Earth (p. 313)**
Core Knowledge Topic: **NA**

8. When European exploration of the Americas began, most European governments were

✔ A. monarchies.

   B. democracies.

   C. theocracies.

   D. anarchies.

Item 8
Reporting Category/Learning Standard: ***Civics and Government*/Forms of Government (p. 314)**
Core Knowledge Topic: **Emergence of a Global Age (1450 to 1750 A.D.) (p. 315)**

9. Which of the following will **most likely** decrease the demand for labor?

   A. a decrease in the supply of available workers

   B. an increase in goods and services produced by workers

✔ C. a decrease in demand for goods and services

   D. an increase in the training and education level of workers

Item 9
Reporting Category/Learning Standard: ***Economics*/Economic Reasoning (p. 313)**
Core Knowledge Topic: **NA**

10. Which of the following will probably occur when interest rates decline?

   A. Food production will decrease.

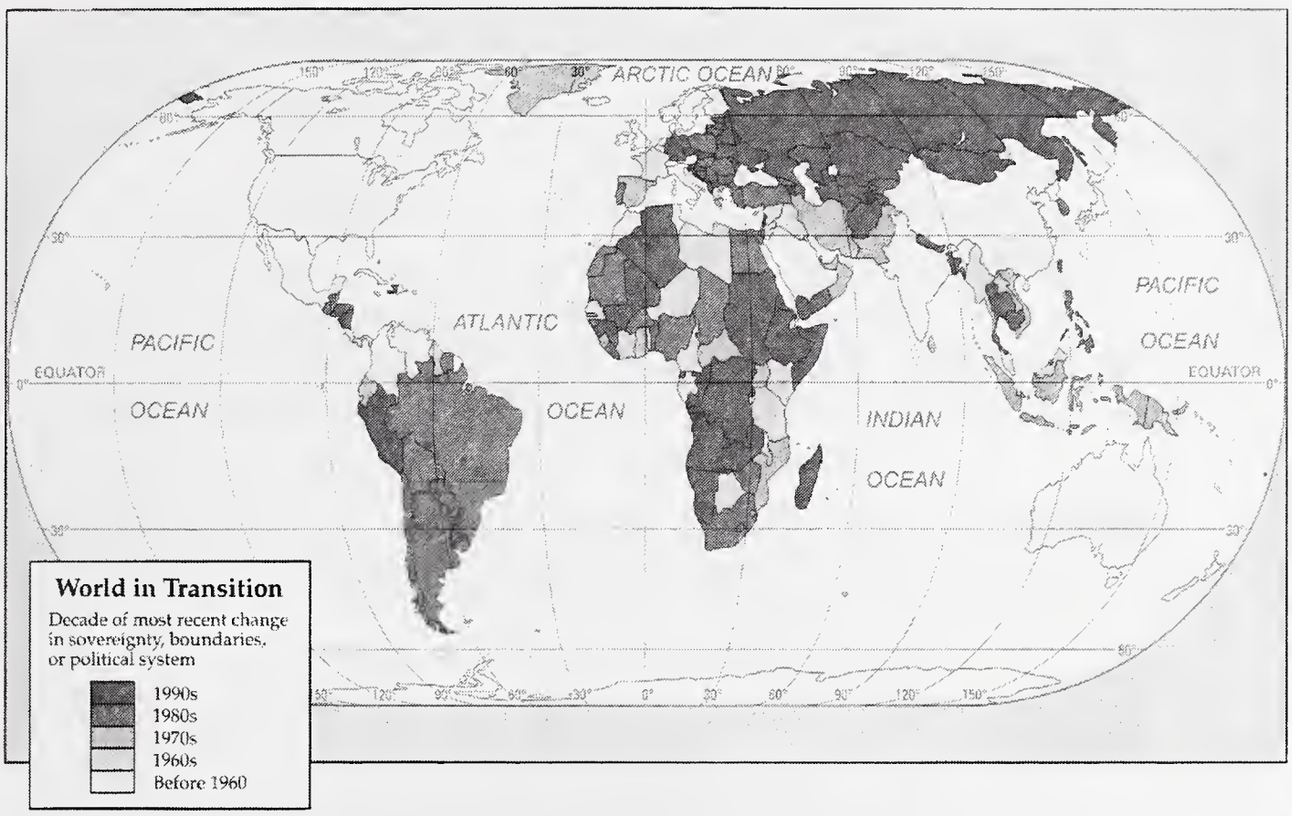
✔ B. Consumer borrowing will increase.

   C. Home purchases will decrease.

   D. Mortgage rates will increase.

Item 10
Reporting Category/Learning Standard: ***Economics*/Economic Reasoning (p. 313)**
Core Knowledge Topic: **NA**

Use the map below to answer question 11.



11. According to the map, which continent has been the most politically stable since 1960?

✔ A. North America

B. Asia

C. Europe

D. South America

Item 11

Reporting Category/Learning Standard: ***Geography*/Places and Regions of the World (p. 313)**

Core Knowledge Topic: **The World from 1945 to the Present (p. 315)**

Session 1, Open-Response Questions

12. An anonymous poet in medieval times described the three social estates (classes) of European society in the following way:

    One toils the fields, one prays, and one defends.

    a. Name the **three** medieval social estates.

    b. Describe **two** characteristics of each estate. Be sure to use historical evidence to support your description.

Item 12
Reporting Category/Learning Standard: ***World History*/Historical Understanding (p. 311)**
Core Knowledge Topic: **Growth of Agricultural and Commercial Civilizations (500 to 1500 A.D.) (p. 315)**

13. Throughout history, humans have transported plants or animals from one region of the world to another. Listed below are some of those plants and animals. Read and think about the list to answer parts a, b, and c.

- potato
- tobacco
- horse
- corn
- wheat

    a. Write the name of one of the plants or animals listed above and state where it was originally found.

    b. Who transported the plant or animal you selected, and where did they take it? Be sure to include details in your answer.

    c. Explain the effects of the plant or animal on the lives of the people who received it.

Item 13
Reporting Category/Learning Standard: ***Geography*/Human Alteration of Environments (p. 313)**
Core Knowledge Topic: **Emergence of a Global Age (1450 to 1750) (p. 315)**

Session 2, Multiple-Choice Questions

14. Which pair of political parties is associated with the French Revolution?

A. Mensheviks and Bolsheviks

✔ B. Jacobins and Girondists

C. Whigs and Tories

D. Nationalists and Communists

Item 14
Reporting Category/Learning Standard: ***World History*/Historical Understanding (p. 311)**
Core Knowledge Topic: **The Age of Revolutionary Change (1700 to 1914) (p. 315)**

15. In the nineteenth century, Mexico and Bolivia gained their independence from

✔ A. Spain.

B. Portugal.

C. England.

D. the United States.

Item 15
Reporting Category/Learning Standard: ***World History*/Historical Understanding (p. 311)**
Core Knowledge Topic: **The Age of Revolutionary Change (1700 to 1914) (p. 315)**

16. Charles Darwin is associated with all of the following **except**

A. natural selection.

B. survival of the fittest.

C. evolution.

✔ D. dialectical materialism.

Item 16
Reporting Category/Learning Standard: ***World History*/Interdisciplinary Learning: Religion, Ethics, Philosophy, and Literature in History (p. 312)**
Core Knowledge Topic: **The Age of Revolutionary Change (1700 to 1914) (p. 315)**

17. Otto von Bismarck unified independent German states during the

A. 1600s.

B. 1700s.

✔ C. 1800s.

D. 1900s.

Item 17
Reporting Category/Learning Standard: ***World History*/Chronology and Cause (p. 311)**
Core Knowledge Topic: **The Age of Revolutionary Change (1700 to 1914) (p. 315)**

18. Adam Smith's writings on *laissez-faire* policies are **most** closely associated with the field of

✔ A. economics.

B. history.

C. medicine.

D. anthropology.

Item 18
Reporting Category/Learning Standard: ***Economics*/Theories of Economy (p. 313)**
Core Knowledge Topic: **The Age of Revolutionary Change (1700 to 1914) (p. 315)**

19. Karl Marx believed that

A. the wealthy should own the means of production.

✔ B. power in society comes from controlling the means of production.

C. economic classes can cooperate with one another.

D. business owners should control the government.

Item 19
Reporting Category/Learning Standard: ***Economics*/Theories of Economy (p. 313)**
Core Knowledge Topic: **The Age of Revolutionary Change (1700 to 1914) (p. 315)**

20. Most European rivalries for imperial territory in the late 1800s occurred in

A. Australia.

B. South America.

C. North America.

✔ D. Africa.

Item 20
Reporting Category/Learning Standard: ***Geography*/The Effects of Geography (p. 313)**
Core Knowledge Topic: **The Age of Revolutionary Change (1700 to 1914) (p. 315)**

21. World War I began almost immediately after the

A. ratification of the Treaty of Versailles.

B. outbreak of the Boxer Rebellion.

✔ C. assassination of Archduke Francis Ferdinand.

D. seizure of Bosnia by the Ottoman Empire.

Item 21
Reporting Category/Learning Standard: ***World History*/Chronology and Cause (p. 311)**
Core Knowledge Topic: **The World in the Era of Great Wars (1900 to 1945) (p. 315)**

22. A capitalist economy typically includes all of the following **except**

✔ A. state-owned factories.

B. private property.

C. profit motive.

D. market competition.

Item 22
Reporting Category/Learning Standard: ***Economics*/Theories of Economy (p. 313)**
Core Knowledge Topic: **NA**

23. Hereditary succession is a practice most often associated with

A. communism.

✔ B. monarchy.

C. democracy.

D. fascism.

Item 23
Reporting Category/Learning Standard: ***Civics and Government*/Forms of Government (p. 314)**
Core Knowledge Topic: **NA**

Session 2, Open-Response Questions

24. Many empires throughout history have gained extensive political and economic power through their control and use of the seas.

    a. Select **one** of these empires and write its name.

    b. Explain how the empire you selected used and controlled the seas to gain **both** political and economic influence over other nations. Be sure to use historical evidence to support your explanation.

Item 24
Reporting Category/Learning Standard: ***World History*/Historical Understanding (p. 311)**
Core Knowledge Topic: **Classical Civilizations of the Ancient World (1000 B.C. to c. 500 A.D.) (p. 315)**

25. Historians call the economic changes that took place in Europe from approximately 1500 to 1700 the Commercial Revolution. Listed below are some terms associated with the Commercial Revolution. Read and think about the list to answer parts a and b.

- mercantilism
- capitalism
- joint-stock company
- inflation
- promissory note

    a. Select **one** of the terms listed above, write its name, and define it.

    b. Explain how the term relates to the economic changes that occurred during the Commercial Revolution. Be sure to use historical evidence to support your explanation.

Item 25
Reporting Category/Learning Standard: ***Economics*/Theories of Economy (p. 313)**
Core Knowledge Topic: **Emergence of a Global Age (1450 to 1750) (p. 315)**

Session 3, Multiple-Choice Questions

26. The United States program designed to help rebuild much of Europe after World War II is known as the

✔ A. Marshall Plan.

B. Truman Doctrine.

C. Kellogg-Briand Pact.

D. Lend-Lease Act.

Item 26
Reporting Category/Learning Standard: ***World History*/Historical Understanding (p. 311)**
Core Knowledge Topic: **The World from 1945 to the Present (p. 315)**

27. The Concert of Europe, the League of Nations, and the United Nations all

A. involved the United States in European affairs.

✔ B. were organized to keep peace after major wars.

C. were military alliances directed against the United States.

D. prevented a defeated power from regaining military strength.

Item 27
Reporting Category/Learning Standard: ***World History*/Historical Understanding (p. 311)**
Core Knowledge Topic: **The World in the Era of Great Wars (1900 to 1945) (p. 315)**

28. In 1928, the first of a series of Five-Year Plans for rapid industrialization was developed by the central government of

✔ A. the Soviet Union.

B. Nigeria.

C. the United States.

D. Japan.

Item 28
Reporting Category/Learning Standard: ***World History*/Historical Understanding (p. 311)**
Core Knowledge Topic: **The World in the Era of Great Wars (1900 to 1945) (p. 315)**

29. In the 1930s and 1940s, the need for which natural resource contributed most to Japan's military expansion into Southeast Asia?

    A. copper

    B. uranium

✔ C. oil

    D. gold

Item 29
Reporting Category/Learning Standard: ***Geography*/The Effects of Geography (p. 313)**
Core Knowledge Topic: **The World in the Era of Great Wars (1900 to 1945) (p. 315)**

30. Fascist governments in Europe in the 1930s were characterized by

    A. an emphasis on individual rights.

    B. peaceful solutions to international problems.

    C. efforts to support the growth of labor unions.

✔ D. rigid state control over many aspects of society.

Item 30
Reporting Category/Learning Standard: ***Civics and Government*/Forms of Government (p. 314)**
Core Knowledge Topic: **The World in the Era of Great Wars (1900 to 1945) (p. 315)**

31. In 1957, which country launched *Sputnik*, the first satellite, into space?

    A. the United States

✔ B. the Soviet Union

    C. France

    D. China

Item 31
Reporting Category/Learning Standard: ***World History*/Interdisciplinary Learning: Natural Science, Mathematics, and Technology in History (p. 312)**
Core Knowledge Topic: **The World from 1945 to the Present (p. 315)**

32. In 1949, the Chinese Nationalist Government that fled to Taiwan was led by

A. Mao Zedong.

B. Ho Chi Minh.

C. Ngo Dinh Diem.

✔ D. Chiang Kai-shek.

Item 32
Reporting Category/Learning Standard: ***World History*/Historical Understanding (p. 311)**
Core Knowledge Topic: **The World from 1945 to the Present (p. 315)**

33. The Soviet equivalent of the North Atlantic Treaty Organization (NATO) was the

A. Popular Front.

B. Comintern.

✔ C. Warsaw Pact.

D. Kuomintang.

Item 33
Reporting Category/Learning Standard: ***World History*/Historical Understanding (p. 311)**
Core Knowledge Topic: **The World from 1945 to the Present (p. 315)**

34. The post-World War II United States foreign policy of *containment* was meant to

✔ A. limit the spread of communism.

B. hold down worldwide inflation.

C. limit illegal immigration.

D. halt the spread of nuclear weapons.

Item 34
Reporting Category/Learning Standard: ***World History*/Historical Understanding (p. 311)**
Core Knowledge Topic: **The World from 1945 to the Present (p. 315)**

35. Which paired group listed below advocated "passive resistance" and "civil disobedience"?

A. the Viet Cong and the Viet Minh

B. the Irish Republican Army and the Palestine Liberation Organization

C. the Red Guard and the Bolsheviks

✔ D. the independence movement in India and the civil rights movement in America

Item 35
Reporting Category/Learning Standard: ***World History*/Interdisciplinary Learning: Religion, Ethics, Philosophy, and Literature in History (p. 312)**
Core Knowledge Topic: **The World from 1945 to the Present (p. 315)**

36. The partition (political boundary) between India and Pakistan was established in 1947 to separate

A. Muslims and Jews.

✔ B. Hindus and Muslims.

C. Hindus and Buddhists.

D. Christians and Muslims.

Item 36
Reporting Category/Learning Standard: ***World History*/Historical Understanding (p. 311)**
Core Knowledge Topic: **The World from 1945 to the Present (p. 315)**

Session 3, Open-Response Questions

37. Historians have described the political situation in Europe in 1914 as "a powder keg waiting for a spark." Listed below are some political terms associated with Europe at that time.

- nationalism
- imperialism
- militarism
- the alliance system

a. Select **one** of the terms listed above, write its name, and define it.

b. Explain how the term you selected has led historians to describe Europe in 1914 as "a powder keg waiting for a spark." Be sure to use historical evidence to support your explanation.

Item 37
Reporting Category/Learning Standard: ***World History*/Chronology and Cause (p. 311)**
Core Knowledge Topic: **The World in the Era of Great Wars (1900 to 1945) (p. 315)**

38. Between 1922 and 1938, Joseph Stalin rose to the positions of Communist Party General Secretary and Premier of the Soviet Union. His rise to power is associated with the policies and strategies listed below.

- organizing agricultural collectives
- liquidating the kulaks
- using police terror and purges
- implementing forced industrialization

a. Select **one** of the policies or strategies listed above, write its name, and define it.

b. Explain how the policy or strategy you selected has led many historians to consider Joseph Stalin a totalitarian ruler.

Item 38
Reporting Category/Learning Standard: ***Civics and Government*/Authority, Responsibility, and Power (p. 314)**
Core Knowledge Topic: **The World in the Era of Great Wars (1900 to 1945) (p. 315)**

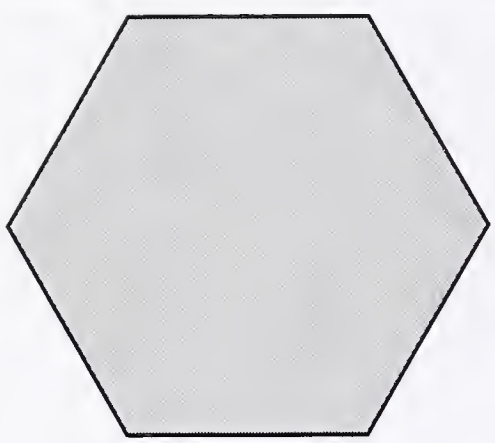
Appendix A

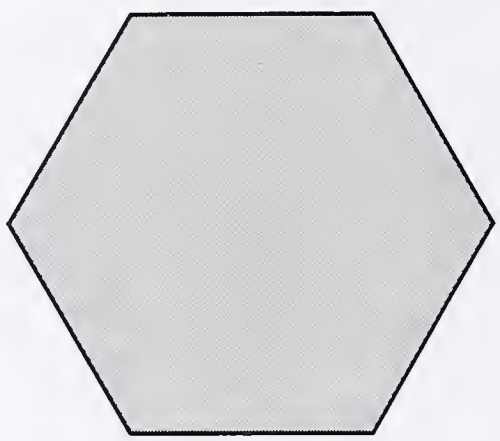
Mathematics Tool Kit and Reference Sheets

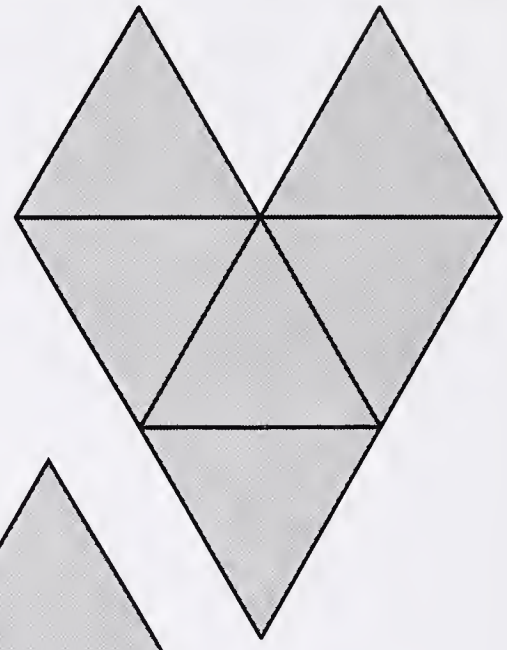
Appendix A

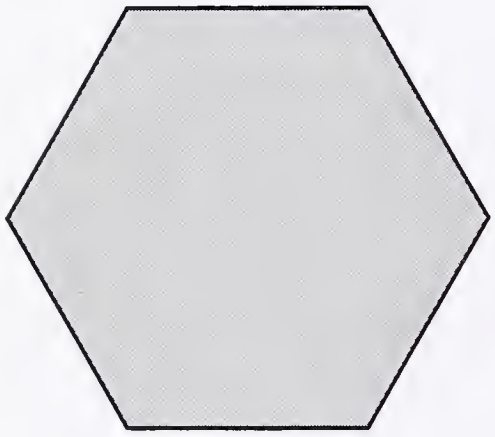
All of the following MCAS Mathematics reference materials are presented in this Appendix in the same sizes as presented to students during testing. In Chapters V through VII of this document, graphics for test items that rely on these Appendix A reference materials for measurement are also presented in the same sizes as they appeared in Student Test Booklets.

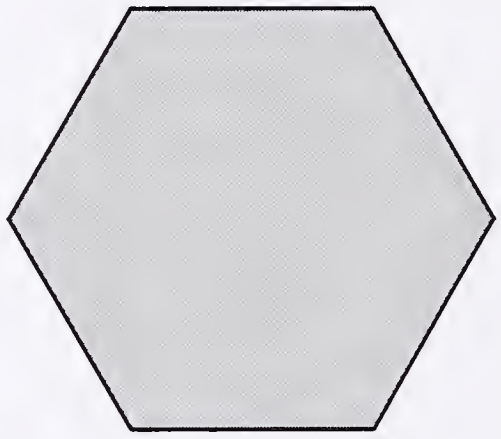
1999–2000 Massachusetts Comprehensive Assessment System
Grade 4 Mathematics Tool Kit

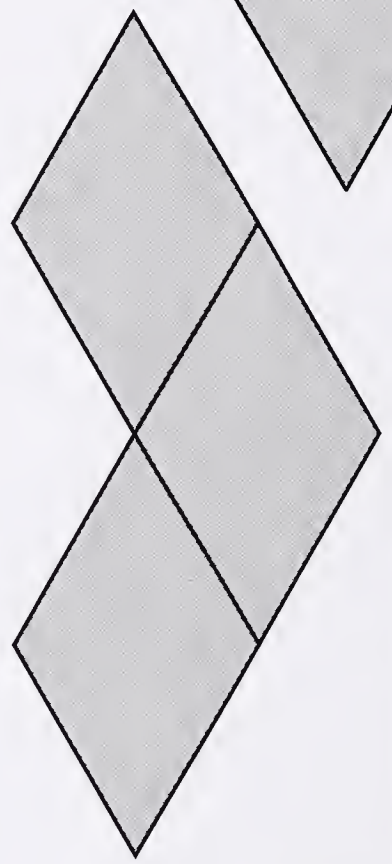


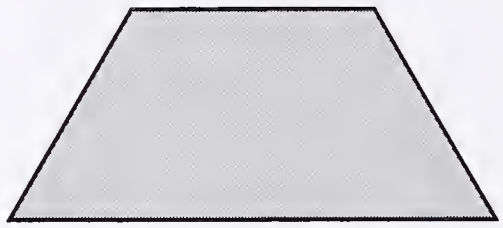


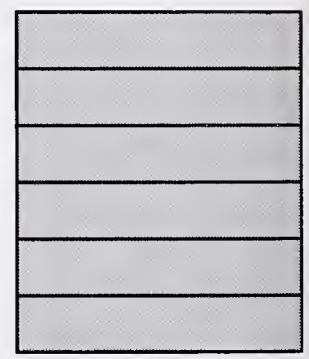


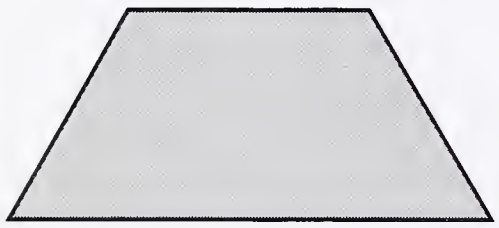


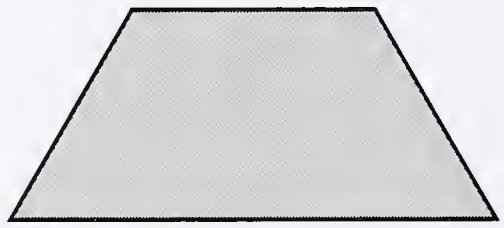


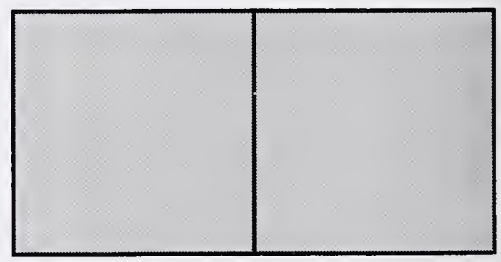


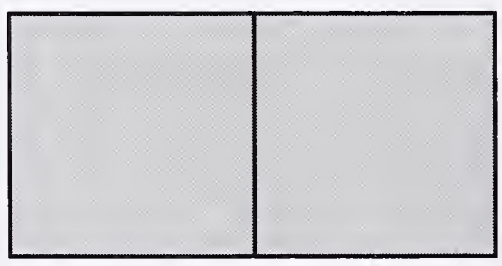


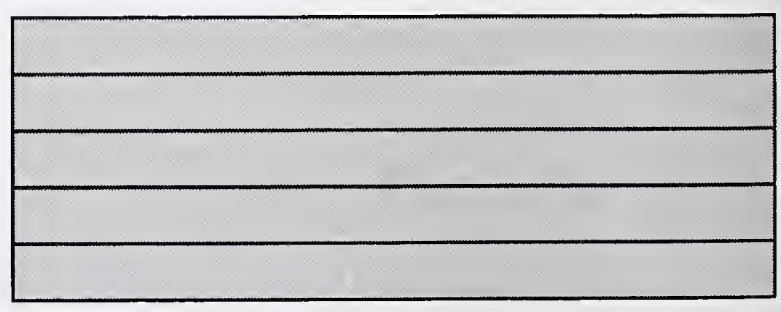


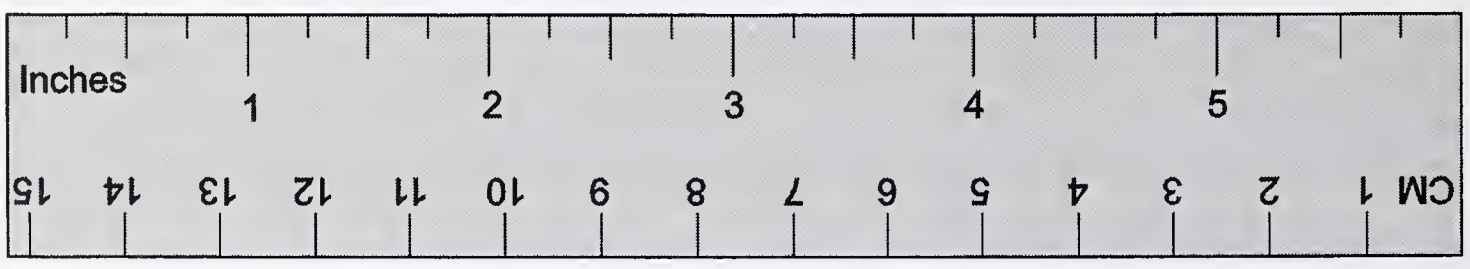


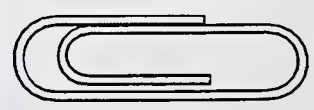












1999–2000 Massachusetts Comprehensive Assessment System
Grade 8 Mathematics Reference Sheet

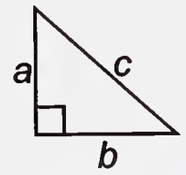
Use the information and ruler below as needed to answer questions in this test.

Perimeter of square: $P = 4s$

Perimeter of rectangle: $P = 2b + 2h$

Perimeter of triangle: $P = a + b + c$

Circumference of circle: $C = 2\pi r$
OR
$C = \pi d$



$a^2 + b^2 = c^2$

Area of square: $A = s^2$

Area of rectangle: $A = bh$

Area of triangle: $A = \frac{1}{2}bh$

Area of circle: $A = \pi r^2$

Volume of rectangular prism: $V = Bh$
(B = area of base)

Volume of cone: $V = \frac{\pi}{3}r^2h$

Volume of cylinder: $V = \pi r^2h$

1 mile = 5,280 feet

1 square mile = 640 acres

1999–2000 Massachusetts Comprehensive Assessment System
Grade 10 Mathematics Reference Sheet

AREA FORMULAS

triangle ..... $A = \frac{1}{2}bh$

rectangle ..... $A = bh$

square ..... $A = s^2$

trapezoid ..... $A = \frac{1}{2}h(b_1 + b_2)$

CIRCLE FORMULAS

$C = 2\pi r$

$A = \pi r^2$

SURFACE AREA FORMULAS

sphere ..... $SA = 4\pi r^2$

cube ..... $SA = 6e^2$

cylinder..... $SA = 2\pi r^2 + 2\pi rh$

VOLUME FORMULAS

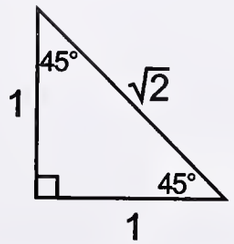
cube ..... $V = e^3$

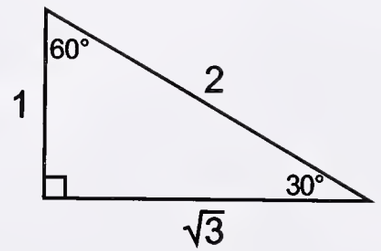
cylinder..... $V = \pi r^2 h$

cone ..... $V = \frac{1}{3}\pi r^2 h$

regular prism..... $V = Bh$ (B = area of the base)

sphere ..... $V = \frac{4}{3}\pi r^3$





Values of the Trigonometric Functions

Angle	Sin	Cos	Tan	Angle	Sin	Cos	Tan
1°	0.0175	0.9998	0.0175	46°	0.7193	0.6947	1.0355
2°	0.0349	0.9994	0.0349	47°	0.7314	0.6820	1.0724
3°	0.0523	0.9986	0.0524	48°	0.7431	0.6691	1.1106
4°	0.0698	0.9976	0.0699	49°	0.7547	0.6561	1.1504
5°	0.0872	0.9962	0.0875	50°	0.7660	0.6428	1.1918
6°	0.1045	0.9945	0.1051	51°	0.7771	0.6293	1.2349
7°	0.1219	0.9925	0.1228	52°	0.7880	0.6157	1.2799
8°	0.1392	0.9903	0.1405	53°	0.7986	0.6018	1.3270
9°	0.1564	0.9877	0.1584	54°	0.8090	0.5878	1.3764
10°	0.1736	0.9848	0.1763	55°	0.8192	0.5736	1.4281
11°	0.1908	0.9816	0.1944	56°	0.8290	0.5592	1.4826
12°	0.2079	0.9781	0.2126	57°	0.8387	0.5446	1.5399
13°	0.2250	0.9744	0.2309	58°	0.8480	0.5299	1.6003
14°	0.2419	0.9703	0.2493	59°	0.8572	0.5150	1.6643
15°	0.2588	0.9659	0.2679	60°	0.8660	0.5000	1.7321
16°	0.2756	0.9613	0.2867	61°	0.8746	0.4848	1.8040
17°	0.2924	0.9563	0.3057	62°	0.8829	0.4695	1.8807
18°	0.3090	0.9511	0.3249	63°	0.8910	0.4540	1.9626
19°	0.3256	0.9455	0.3443	64°	0.8988	0.4384	2.0503
20°	0.3420	0.9397	0.3640	65°	0.9063	0.4226	2.1445
21°	0.3584	0.9336	0.3839	66°	0.9135	0.4067	2.2460
22°	0.3746	0.9272	0.4040	67°	0.9205	0.3907	2.3559
23°	0.3907	0.9205	0.4245	68°	0.9272	0.3746	2.4751
24°	0.4067	0.9135	0.4452	69°	0.9336	0.3584	2.6051
25°	0.4226	0.9063	0.4663	70°	0.9397	0.3420	2.7475
26°	0.4384	0.8988	0.4877	71°	0.9455	0.3256	2.9042
27°	0.4540	0.8910	0.5095	72°	0.9511	0.3090	3.0777
28°	0.4695	0.8829	0.5317	73°	0.9563	0.2924	3.2709
29°	0.4848	0.8746	0.5543	74°	0.9613	0.2756	3.4874
30°	0.5000	0.8660	0.5774	75°	0.9659	0.2588	3.7321
31°	0.5150	0.8572	0.6009	76°	0.9703	0.2419	4.0108
32°	0.5299	0.8480	0.6249	77°	0.9744	0.2250	4.3315
33°	0.5446	0.8387	0.6494	78°	0.9781	0.2079	4.7046
34°	0.5592	0.8290	0.6745	79°	0.9816	0.1908	5.1446
35°	0.5736	0.8192	0.7002	80°	0.9848	0.1736	5.6713
36°	0.5878	0.8090	0.7265	81°	0.9877	0.1564	6.3138
37°	0.6018	0.7986	0.7536	82°	0.9903	0.1392	7.1154
38°	0.6157	0.7880	0.7813	83°	0.9925	0.1219	8.1443
39°	0.6293	0.7771	0.8098	84°	0.9945	0.1045	9.5144
40°	0.6428	0.7660	0.8391	85°	0.9962	0.0872	11.4301
41°	0.6561	0.7547	0.8693	86°	0.9976	0.0698	14.3007
42°	0.6691	0.7431	0.9004	87°	0.9986	0.0523	19.0811
43°	0.6820	0.7314	0.9325	88°	0.9994	0.0349	28.6363
44°	0.6947	0.7193	0.9657	89°	0.9998	0.0175	57.2900
45°	0.7071	0.7071	1.0000	90°	1.0000	0.0000	—

Appendix B

English Language Arts Copyright Acknowledgments

Appendix B

Grade 4 English Language Arts Reading Passages

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Appendix C

Selected Bibliography

Appendix C

Selected Bibliography

The following Massachusetts Department of Education publications may be found on the Department's Internet site at **www.doe.mass.edu/mcas.** Many are also available at your local public library.

Massachusetts *Curriculum Frameworks*

On the Department's Internet site, these documents are found under "publications/test related/Massachusetts Department of Education Curriculum Frameworks."

English Language Arts Curriculum Framework (1997)
History and Social Science Curriculum Framework (1997)
Mathematics Curriculum Framework: Achieving Mathematical Power (1996)
Science & Technology Curriculum Framework (1996)

MCAS *Guides*

On the Department's Internet site, these documents are found under "publications/test related/Guides to the MCAS."

Guide to the Massachusetts Comprehensive Assessment System: English Language Arts (1998)
Guide to the Massachusetts Comprehensive Assessment System: History and Social Science, Spring 1999
Guide to the Massachusetts Comprehensive Assessment System: Mathematics (1998)
Guide to the Massachusetts Comprehensive Assessment System: Science & Technology (1998)

Previous Years' Released MCAS Items

On the Department's Internet site, these documents are found under "publications/test related/Test Questions."

Release of Spring 1999 Test Items
Release of Spring 1999 Spanish-Version Test Items
Release of May 1998 Test Items

Appendix C

Samples of Student Work

On the Department's Internet site, samples of actual student work from previous years' MCAS tests are found by subject area under "the MCAS/Scoring Guides, Student Work."

- Samples from the 1999 MCAS administration are available only on this Internet site; no printed publication is available.
- Samples from the 1998 MCAS administration are available both on the Internet site and in the printed publication, *MCAS Performance Levels: Sample Student Responses, Tests of May 1998*.

Other MCAS Publications

On the Department's Internet site, the following documents are found under "publications/test related."

Question and Answer Guide on the Statewide Testing Program (1998)
A Student's Question and Answer Guide on the Statewide Testing Program (1998)

The following documents are found under "publications/test related/Participation Requirements."

Requirements for the Participation of Students with Disabilities: A Guide for Educators and Parents (Spring 2000 Update)
Requirements for the Participation of Students with Limited English Proficiency: A Guide for Educators and Parents (Spring 2000 Update)

The following documents are found under "publications/results related."

Guide to Interpreting the 1999 MCAS Reports for Schools and Districts
Guide to Interpreting the 1998 MCAS School and District Reports
"Facts on Scoring of Student Answers to Open-Response Questions and Writing Prompts"